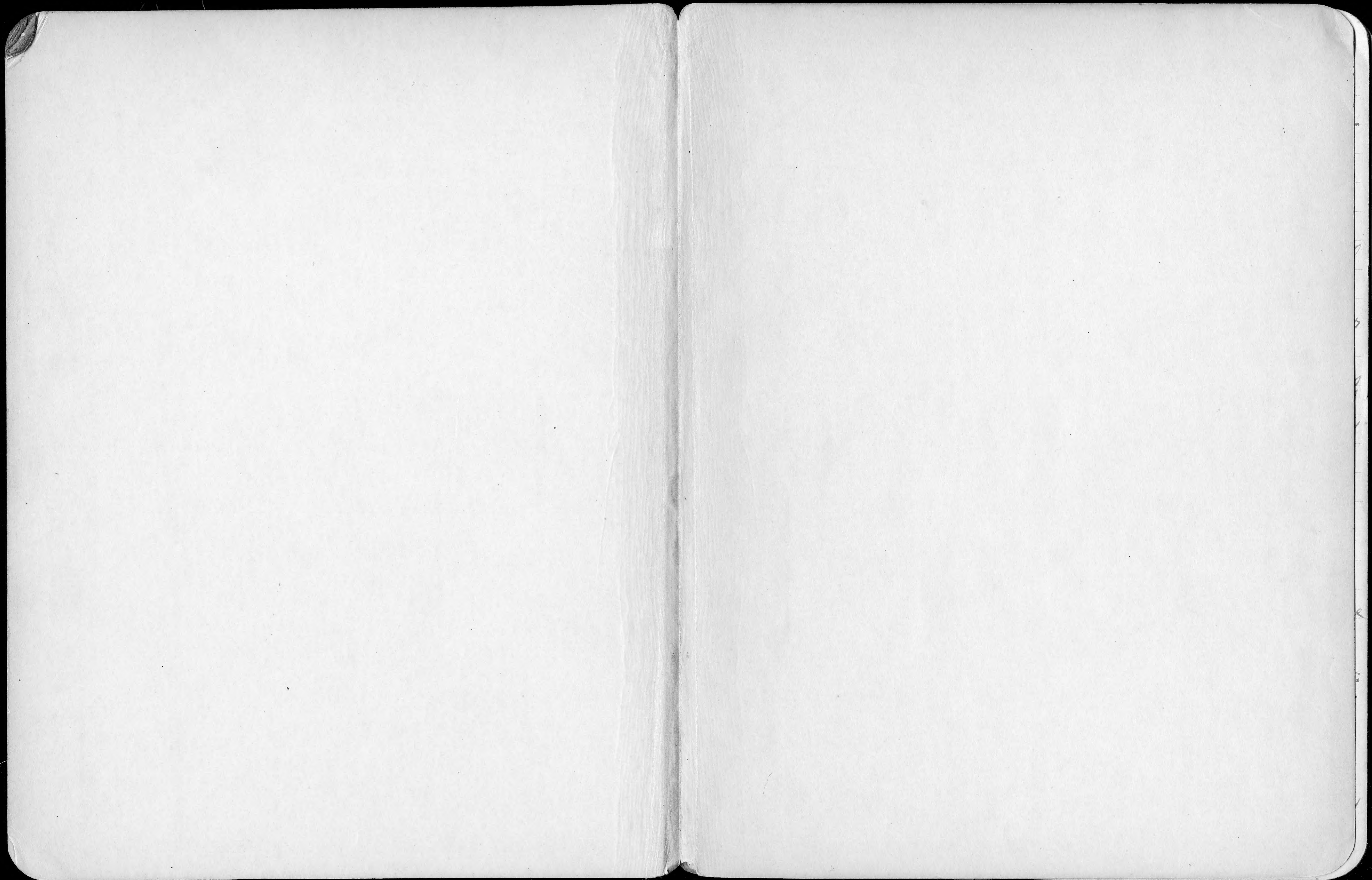
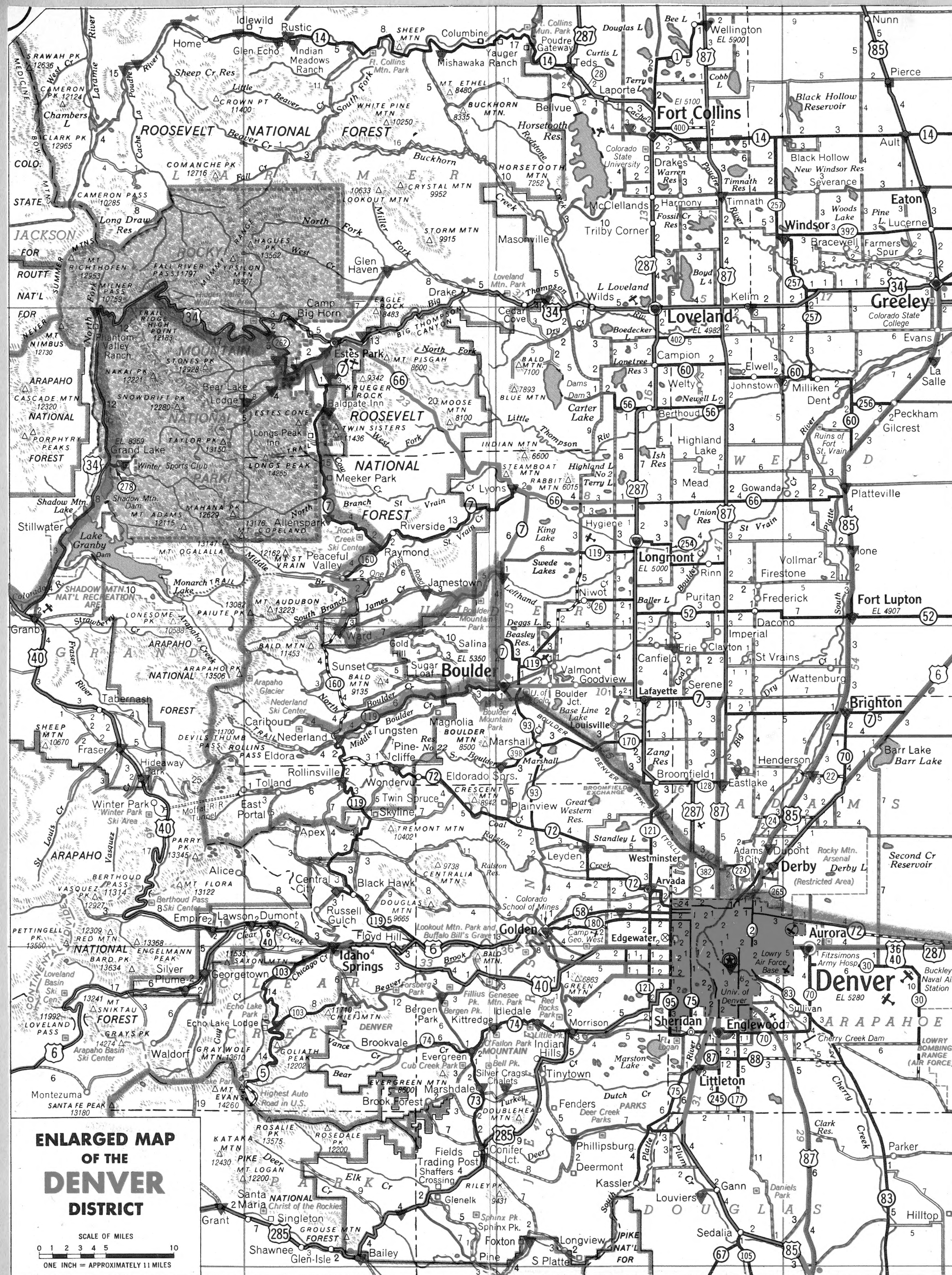


1960 Journal

1962

1964





1960

June 14. Left Carbondale with John Lawrence at 10:30 a.m.
Tues. in a university Ford 4-door (1960 model) for Utah, Nevada, and Colorado.

Route was #13 to Pincheyville, #154 to Red Bud, #3 to Jefferson Baradas Bridge, St. Louis Bypass to Bypass U.S. 40, Bypass 71 north of Kansas City, #71 to St. Joseph, U.S. 36 west to Marysville, Kansas. 530 miles

Arrived at 11 p.m. (CDT) and stopped at Thunderbird Model (444) west of town. No collecting.

June 15 Marysville, Kans. to Boulder, Colo. miles. Route

Wed. U.S. 36 to Denver outskirts, #72 (bypass) to Denver-Boulder Turnpike. Stopped at Tassle Model.

Station 1. On highway 36 near Stevens Center, Kans. Running on pavement. 1 Carabid, large.

Station 2. 7 mi. east of Joes, Colo. on highway 36. Many 7/8-inch Tenebrionids running on pavement or sandy shoulder. 1 Mutillid. A variety of Hymenoptera, flies, Mordellids, etc. on roadside plants.

Station 3. 5 mi. east of Byers, Colo. on highway 36. Explanate Elodes with red stripes on each elytron running on pavement (2). At least two species of Meloids on fl. black-eyed susans; also lacewing, Chrysomelid, etc.

John visited Ronald Eff, amateur lepidopterist, in evening, while I read proof of article for SYSTEMATIC ZOOLOGY.

June 16. ^{Station 4.} Boulder & vicinity. Went out south of town to Chautauqua Mesa, where lupines were profuse. Learned to spot the eggs of "blues" on the undersides of leaves and on buds and spent the morning collecting them, to be mailed back to S. I. U. for rearing. Got 100+. Also found mature larvae, always on buds and associated with ants (two species). Collected several dozen adults, as well as miscellaneous bugs, bees, damselflies & beetles. After lunch (& purchase of hat, cap, sunburn lotion), drove up Flagstaff Mt. road about a mile, elev. about 7000 ft. above Boulder.

~~Station 5. (see above).~~ From Sta. 4. we mailed back 133 eggs. Majority were Plebejus icarioides. A few were Phaedon piasus. Both species were seen to oviposit on the same host plant, but piasus seems to select buds, whereas icarioides will lay on leaves, stems, and flowers. Other insects include 6 Raphidiidae, a large black sawfly and Cerambycid black with yellow transverse stripes. Will keep the mature larvae for parasite emergence. Kept the immatures with the associated ants. Host lupines were collected. ^{Lupinus}

Station 5. Flagstaff Mt. road about 1 mile above Chautauqua Mesa, 1000 ft. above Boulder. A few lupines. Found very little except a

~~green or blue Meloid.~~ few bees, bugs, beetles. No eggs or larvae

Then returned to Boulder and drove up the main canyon to the west - to Nederland. Then on up a road toward Caribou - a sky area. The car simply wouldn't pull the grade.

Station 6. Caribou, above Nederland, Boulder Co., 8800 feet, along an abandoned railroad embankment now used as a road. Lupines inconspicuous but abundant. 65 eggs found on buds. May have been 2 spp. of lupines (both collected). Many flowers of many sorts. Collected a few spiders (2 bright yellow), two bees under dung, several black spiders also under the dry cow dung, metallic Meloids.

Still at LaSalle Motel, Boulder.

June 17. North on rte. 7 to Left Hand Canyon, to visit one of Eff's lupine localities. Found it forked. Continued up main canyon west. 6500 ft. elev.

Station 7. 10 mi. W. of rte. 7 in Left Hand Canyon. A charming Sphingid on a glabrous lupine. 1 larva with ant and one or two eggs of a blue. Lupine sample collected. Several dozens adult blues, several large bumblebees. Also two more mature larvae with associated ants. Miscell. beetles & flies & wasps.

Speedometer 10,005

Lunch at Ward, Colo. Elevation 9254'. Altimeters both on the nose (set at Boulder). ^{Colo. rte. 160}

Station 8. 5 mi. north of Grand Lake. Speedometer 10,087.

Elevation 8750. 2 blues + small scarabaeid.

Station 9. On Highway 84, 1 mile w. on Gore Road. Dead beaver beside road, skull mashed. Took off left hind foot for stains. Elev. 7650.

From Estes Park followed Moraine Park road, crossed little moraine to w. end of Deer Mt., then took "new" Trail Ridge Road, which climbs to ^{12,143} ~~11,000~~ feet on the windwept ridge, then drops to Milner Pass at 10,759 feet as the road swings south to Grand Lake. Had a good view up an old valley north of the small moraine, but couldn't see any cabin. The view from Trail Ridge Road is grand.

Came out at Grand Lake on US 34, then west on US 40. Rabbit Ears Pass was closed for construction, so we took the Gore Pass Road to the south - rte. 84. It was dark all the way to Steamboat Springs, where we found a VFW convention and all rooms filled. So went on to Craig.

Speedometer - 10255.

June 18. Station 10. 4 mi. w. of Maybell ^{Colo.} on US 40. Elevation 6250 ft. Speedometer 10290. Lupines of Great Basin variety. Saw no adults, one hatched egg on leaf. Collected lupine samples. Also the lupine from farther east, with mature larvae around base, with two species of ants in attendance. Large fly without mouthparts, maic. Hymenops. Two first instar larvae on "silver" lupine and several eggs ($\frac{1}{2}$ mile farther on). Lupine in plant press of two kinds: The one marked Host Lupine is the silver. The Non-host Lupine of plant press yielded the larvae at base. It has the prominent rib, the narrow folded leaves, and bright green color.

At Vernal stopped at Museum for directions into the Uintas. Also made reservation at a motel (Dinosaur) for tonight. Speedometer 10384.

Station 11. 20 mi. n. of Vernal ^{Utah}, on rte 84. 8200 feet. Many isolated lupines. Found one empty egg, larval damage. Collected 50 or so adults of two or more species. Samples of lupines. 4-5 p.m.

Found a 10-point antler - old + broken. Also a Lucanid (*Platycerus*), a Carabid, a variety of wasps, a robber fly with captured moth, etc.

Blues included: *Phaedrotes piasus* (11), *Glaucopsyche lygdamus* (3), *Plebejus icarioides* (19♂, 6♀), *Lycaenopsis pseudargiolus* (1). Also *Coenonympha* (8), *Oeneis* (arctic - 1), *Papilio* (1).

Station 12. Vernal, Utah. At lights. 2 crickets and 1 Trichopteran.

Drove through part of the Uinta Basin, formed by the upended and truncated Mesozoic and Paleozoic beds separated by erosion from the mass of the Uinta Mountains. These beds are colorful, and continue into Dinosaur National Monument to the east. The Uintas visible from Vernal as north of it are rounded and tree-covered, with sharp box canyons and valleys. Farther back, they are more rugged and patched with snow. Highest peak is King's Peak, 13,498 ft., which is also the highest point in Utah.

June 19. Continued on US 40 about 20 mi. west of Duchesne, Utah. ^{Speedometer 10516.} Then, north on Rte. 208 10 mi., northwest on Rte. 35 along Duchesne River. This seems to be a continuation of Uinta Basin. For miles the telephone poles carried TV lead-in dual cable with connections to every house or ranch.

This road heads across the southwest corner of the Uintas.

Station 13. 14 mi. SW of Tabor. 7320 ft. In Wolf Creek canyon. Papilio, Icaroides, Hymenoptera, Chafers in sweeping, Cicindela, large perfect Papilio abundant.

Station 14. Speedometer 10558. Same road.

Several hatched eggs, many male Icaroides and a few females. Pair of Asilids in copula. One pair of the lobes in copula. Red & black Clerid. Elev. 7425 ft.

Continued on Rte. 35 to Kamas. Had a second lunch and doubled back on Rte. 150 into the Uintas. Mileage at Kamas was 10575. At 10,590 arrived at Soapstone Guard Station. 7800 feet.

Station 15. The "guard" didn't know of any Forest Service building we could use for an office. He is a temporary employee under the ranger.

We then continued over the pass to Mirror Lake, and on the way had a splendid view of the real Uintas, very rugged and grand.

The guard at Mirror Lake also knew of no lupine, so we went back over the pass.

My father did some geology in the Uintas in the first decade of the century, but I can't recall hearing any details about that trip.

June 20. Camped at 7500 ft. on Mirror Lake Road in Uinta
Mon. Mts., a few miles below Soapstone Guard Station.
The Wolf Creek Pass Road comes in at Soapstone but
was closed, so we came in through Kamas. At
Shingle Creek Forest Camp. Speedometer 10634.

Station 15. 3 mi. w. of Shingle Creek Camp. Open sage-
brush hillside and creek bottom. Many cicadas,
misc. bees, beetles (esp. Clerids), several Hesperids, etc.
Raphidoid apparently on sage, robber fly. 2 Aegeriids.
At entrance to Yellow Pine - Castle Lake Trail.

Station 16. 2 mi. above Hailstone, Utah.

1 Clerid. Photo of private fish hatchery.

Station 17. 5 mi. ^{at M.S. 10} n. in East Canyon. 6025 feet.

Speedometer 10676. General collecting. Many
Cicadas, flies, 25 eggs + 1 ♂ *icarioides*, Hymenops,
grasshoppers.

Station 18. "Parley's Last Chance" station, 1 mi. s. of
Lamb Canyon on ~~the~~ US 70. Elev. 5850 ft. Lupine in
bloom, eggs on leaves + buds, 2 ♀ + 1 ♂ *icarioides* flying.
1 Crambycid, small beetles, 1 *Colias*, a bumblebee, etc.

June 21. Went up to Biology Department at the University.
Tues. Had a nice visit with Angus Woodbury, who
showed us a new proposal to protect the
Rainbow Bridge from Colorado River develop-
ment plans. Beautiful aerial photographs
of the canyon regions involved.

Had lunch with Don M Rees and A R Gaufin,
at the Union Cafeteria. Then found Steven
Janson, who has been marking blues in
advance. ~~the~~

Drove up Big Cottonwood Canyon, where
Steve demonstrated his marking method,
using red India ink. The specimen marked
flew normally, but never very far. She seemed
worn. After first flight of 4 feet, she rested
for 20 minutes, and then flew only when
directly disturbed, for only a few feet,
seeming to be impaired or upset. The
marked wing seemed to be damaged.

Station 19. Mouth of Big Cottonwood Canyon,
elev. 5100 ft. Count of lupine stalks/eggs was
17/51 (John) + 5/50 (Dick). 2 spp. of Bombyliids, 1 ♂
Plebejus melissa (it was common on clover), 3 or 4
Strymon melinus in excellent condition, 1 ant in
association with *icarioides* larva, 3 larvae in all.
Thistles in bloom. 1 larva ready to moult.

Station 20. Brighton, top of Big Cottonwood Canyon. About 8300 feet. 1 sawfly, ² Cicin-
^L Idola, Callophrys sp. (green hair-sheath), Phyciodes,
 3 or 4 small Asilids, Cicadas were singing but
 not collected.

Included in this was a side trip 2 miles up
 the Guardsman Pass Road, where the lupines were
 found, but very immature. No blues seen.

June 22. Took car for oiling, greasing, carburetor adjustment.

Wed. Then drove up benches ~~back~~ of north of city.

Station 21. City Creek Canyon above Salt Lake City.

^L Few lupines, only 3 hatched eggs. 6 icarioides,
Phylodes, melissa, Everes ^{cornutus} ~~amabilis~~, Strymon
molinus, good general collecting. Acmaeodera,
Anthriscids, Cremastocheilus, Coccinellids, bee
 flies, many Hymenops, a Thysanuran, etc.
 All in about an hour.

Station 22. Emigration Canyon, above Salt Lake City.
 Elevation 5850. Many ~~flowers~~ lupine.

^L 1 ~~major~~ mature icarioides larva with ants, very large;
 took lupine count and samples, another larva with
 smaller ant, about 6 adults, 1 piacrus, 1 melissa,
 a white skipper, large Sphinx larva on road evi-
 dently parasitized, many snake flies on lupine,
 large reddish Tudius also on lupine, 1 Cicada, misc.
 Hymenops, Acmaeodera, 2 Clerids.

Station 23. Reservoir in upper part of East Canyon,
 on road from Emigration Canyon to Hennefer or
 Morgan. 2 flies.

John spent the evening with friends, so I
 took his mother to dinner at the Hot Shoppe and
 then mounted part of the day's catch.

June 23 Out at 9:15 after putting away some of last
 Thurs. night's catch. Headed for Mill Creek Canyon,
 between Parley's and Big Cottonwood.

Station 24. 10 mi. above mouth of Mill Creek

^L Canyon, elev. 7550. 4 Glaucopsyche, 3 Everes (tailed),
 3 Asilids, 1 Syrphid, 1 sawfly, 2 Clerids. Glabrous
 crisp lupine collected. Two yellow + a red flower
 also collected. Egg count 0/33 stalks.

John described the varied relationships between
 the Tyrannidae and ants. Some are completely
 independent, some facultative myrmecophiles, and
 some obligate. Referred to Baldwin's summary.
 John has been accumulating the data on this
 one family and may publish it.

Station 25. 1 mi. above entrance to Mill Creek
 Canyon. Elev. 5350. No lupine. Acmaeodera, a
^L small hermesid, Plebejus acmon, Phylodes betuloides,
Callipsyche pehrii (all 3 blues), large dragonfly, ano-
 ther sp. of snakefly, 1 Cicada.

Station 26. 1 mi. above Alta, Utah, on road to upper basin. No blues, took lupine sample. 2 *Cicadella*, robber flies, green chafers, bugs.

Station 27. Little Cottonwood Canyon. Speedometer 90%. Elev. 6660. Lupine in bloom, eggs on 2/50 stalks. No adults. (Light rain just passed. *Nemognathine* on thistle, *Hymenops*, clusters of *Bembex*, bumble bees, *Acmalodes*, wasps, *Malacoderm*?

Station 28. Same as Sta. 19. Lupine very old, no blues, no eggs, no larva. On bench to east, south of Canyon entrance, saw one egg, took one larva.

June 24. Out to Stansbury Mts. south of Great Salt Lake. Fri. Searched for lupines near base of canyon; found none.

Station 29. South Willow Canyon, 9 mi. s.w. of Grandville, Tooele Co., Utah. Elev. 7300 ft. Many moths flying, *Cicadas* high. ^{Many} *Speyeria* ^{compositas} for Donald off, *Philotes* (2), *Evers* *amputula* +, *Tachinids*, *Tabanids*, *Bombyliids*, *Therewids*, *Stenomysids*, *Muscids*, *Tipulids*. Very large Bumblebees, ^(3 spp) on thistle at lower elevations, 2 *Meloids*, 1 *Clerid* also on thistle; 8 *Phocoids*, a bronze *Buprestid*, lacewings.

Station 30. North Willow Canyon, e. side Stansbury Mts., Elev. 6050 ft. Many *Speyeria*, Cedar-sage area, - *Erigeron*, *Sage*, thistle. *Melissa*, *Mitoura siva*. *Aegerid*.

Station 31. Pass between Grandville & St John. Elev. 5450 ft. Large field of thistles. Took a few *Nemognathines*, some *Clerid* or *Malachids*, many types of *Hymenops*, *Cicadas*,

Station 32. Johnson's Pass between ^{the} Stansbury and the Onagui Mts. Elev. 6237 ft. *Speyeria*, slender *Asilids*, in copula, *Bombyliid*, 1 *Colias alexandra*, vial of *Laryx*ids from thistle. ^{Dermatids from dead rabbit. also *Hesperids*.}

Station 33. Eureka, Utah. Cemetery west of town. One large *Elaterid* only.

June 25 Sat. The only place near Salt Lake City where we have found much was Parley's Canyon (Rte 40), where we collected the day we arrived, so we went back there for another try.

Station 34. Same as sta. 18. Parley's Canyon, elev. 5800 ft. Took a score or more of eggs, at least two score male *icarioides* and 8 or 10 females. Kept the latter alive to see if they wouldn't lay more eggs for us. ⁽²⁾ No larvae. John sifted several ant nests for pupae, but they weren't in evidence. Stalk count of *icarioides*, of 135 stalks 16 had eggs, additional stalks uncouned. All females except four died by 2 p.m. Sunday without laying eggs. One egg was laid by that time. These four put in sum.

June 26. Spent the morning mounting insects, cleaning
 Sun. bottles, and preparing for more travels. In the
 afternoon I called on Arthur & Crawford, his
 wife, and their granddaughter Mayorie. Stayed
 for supper and until 9:30 chatting with Arthur.
 He's always interesting, and we ranged from
 politics to philosophy to evolution and back
 to L.D.S. and Catholicism as authoritarian
 religions compared to Protestantism in general.
 Mrs. Crawford particularly emphasized their fond-
 ness for EB and their indebtedness to him for
 past help and friendliness. Home in time to
 write a letter to EB + VBB.

John to his aunts, Emily + Dean Henroid, and
 then took his grandmother, Ella Owens, and his
 mother to see a 95-year-old lady from Eureka.

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Fast Friday from Johnson Pass we headed south-east to visit Eureka, where John was born. We turned up Church Street looking for the Downey's former home - birthplace - but the house was gone and not even foundations visible. We inquired directions from a young lady who turned out to be a former student of John's at Utah U, now married to a former friend of John, Frank McCabe, who works for Continental Mine Co. of Eureka. He had just been a bad auto accident. We then drove back west to the cemetery, where a Mr. Webb told us much about the arrangements.

John's grandfather's grave is there - in "Catholic Row" - but we couldn't find it. (Later told that it is unmarked. Found the Owens' (maternal grandmother) plot, where her son Frank is buried. Found plot of another John C. Downey - no relation. He was also an electrician at the mines, as was John's father, but the latter was also Chief of Police of Eureka. Mr. Webb recognized the right Downey as: "Oh yeah. The Cop! The guy that got the Legion of Honor."

The Croix de Guerre with six palms awarded personally by Foch. Also the Medal Militaire. Also the Silver Star from Pershing. Recommended also for Congressional Medal of Honor, but it was never awarded.

He was an electrician stringing communication lines, but sometimes he had to carry messages as a runner. On three such trips he was gassed, and died of this in February 1933 in the Veterans Hospital in Tucson, Ariz. He was buried with full military honors in Salt Lake City, and the family rode with the casket from Tucson.

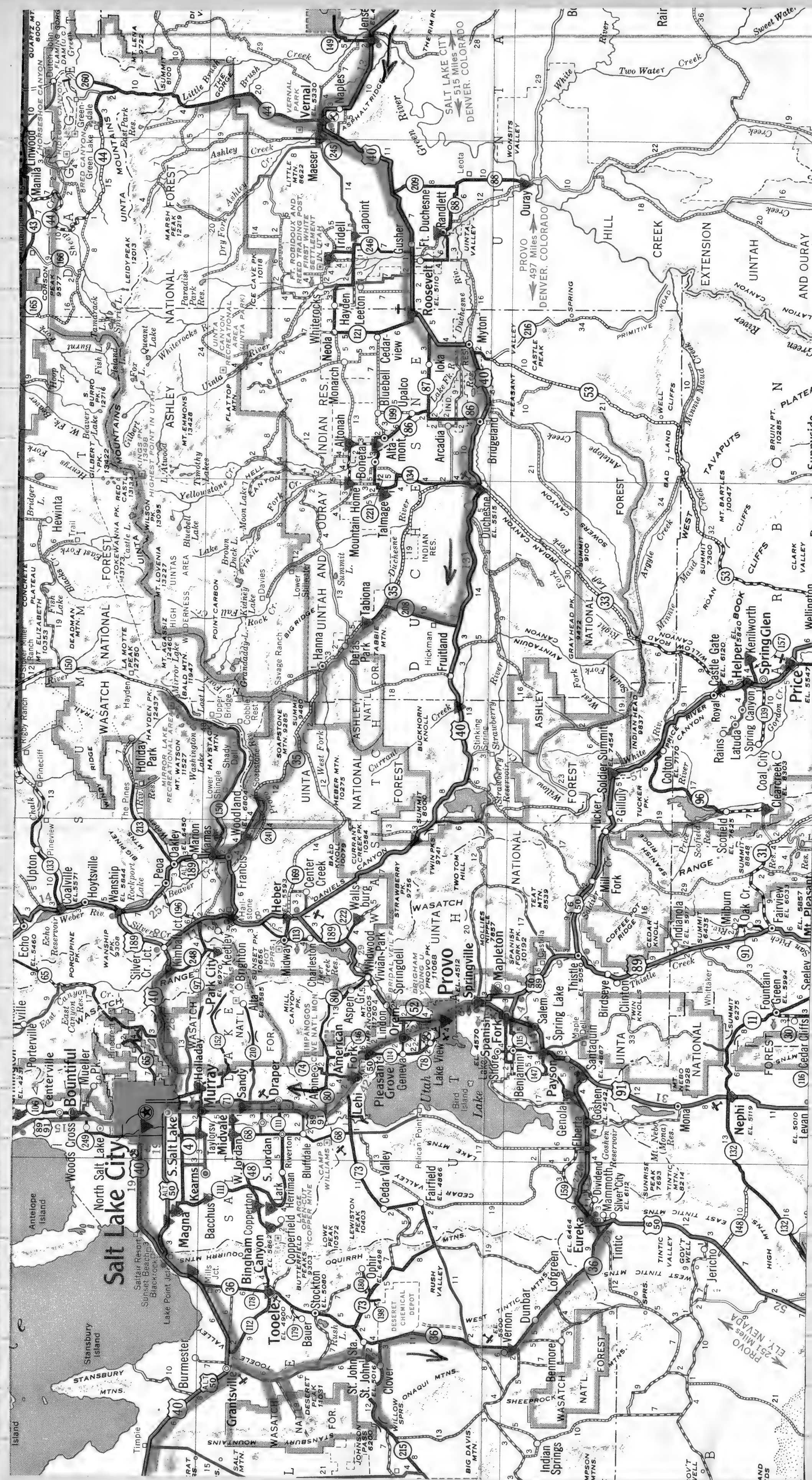
We continued northeast to Santaquin, east of the south end of Utah Lake, where we stopped for a few minutes to see June Downey Stewart, who is a cousin. She had seen the grave within 3 years.

Then on to Provo where we stopped again to see Jessie Downey (or) who is June's brother, mother's cousin, who was living in Tucson with the J C Downeys the year in the hospital.

John's mother is Cleone Owens Downey. Her mother is Ella Owens whom we visited several times. (We stayed with Cleone while in Salt Lake.) She is 83, very alert, hears well, sees better than she admits, plays bridge, lives alone, and has a remarkable memory even for recent things.

Cousin Charlotte Edlin (daughter of Emily & Dean) called one evening. Another daughter, Frances Ma, lives in Boise, Idaho.

June 27. Up early to pack, do some errands, and leave for Men. Utah Nevada. Went to University to borrow 6 Schmidt boxes, as we have filled the five we brought. Then met Steve Lurant. Waited an hour for the mailman, and in the meantime went down to Zion Bookstore. Couldn't find out anything about a rumored history of the Tintic Mining area (Eureka), but saw some interesting things. A first edition of Spencer's Principles of Biology (\$17.50), a volume called "East of the Sun and West of the Moon" by Kermit Roosevelt, Patton's Evolution of the Vertebrates which I snatched up for \$5.00, an Italian dictionary, a Portuguese one, a Swedish one, all of which were new and \$4.00 each, and a new book on the mountains of Wyoming. Looked interesting but may be primarily concerned with recreation. John wanted a copy of Wallace's but resisted it. Also a book on cannibalism! This is a large bookstore with many interesting books, including copies of Haeckel, an old Swinerton paleontology, much western history, quite a few philosophical science books, and the many popular evolution books.



Followed U.S. 40 to Wendover, then on to Peguop Summit 20 miles east of Wells. Found lupine scarce in same locality as previous years and took a few eggs. Then two miles west, below the summit, found a side road through a gate up a narrow winding valley to the southeast. Followed it a mile in the car and then another mile on foot. At the end of the two miles found lupine in abundance, with some eggs.

Station 35. Peguop Summit on U.S. 40, 24 mi. west of Wells, Nevada. *Isarioides* eggs rare on lupine (same as collected 1959 and earlier).

Station 36. Small canyon southwest of Peguop Summit, same elevation. Eggs on lupine, bringing to 47 the total for "Pebay". An *Eledus* and

Station 37. Wells, Nevada. At lights, a few dark *Melolontha* and a smaller *Melolontha*.

Speedometer 11493

June 28 Decided to stay in Wells another night and work
Tues. in the Ruby Mts. So drove down the east side, after mailing the 46 eggs collected last night. They go by Air Mail, but from here that may take more than two days.

Station 38. 13 mi. n. of Ruby, Nev. Much lupine along road at elev. of 6000 ft. Eggs scarce, 1 ♀ + 1 ♂ *isarioides*, 1 *Melissa*, misc. flies + hymenoptera. Took sample of lupine. Three cast skins of larvae on lupine. More ~~un~~hatched eggs than unhatched. Quite a few Neuropteran eggs. Larger red and black ant on one lupine - antagonistic - but they were definitely tending red aphids.

Station 39. Along road just south of Ruby Valley, Nev. Many blue but few *isarioides*, eggs scarce, fine general collecting: 2 *Phiphiptera*, red weevils, many Diptera + Hymenoptera. (See list on next page.)
also 2 Sapygidae.

Had lunch at the Park House, a hunting lodge and beer bar at Ruby Valley, which is nothing more than that. Had lunch with the family for \$1.25 each. OK except for lack of liquids. Continued south to Harrison Pass road over Rubies.

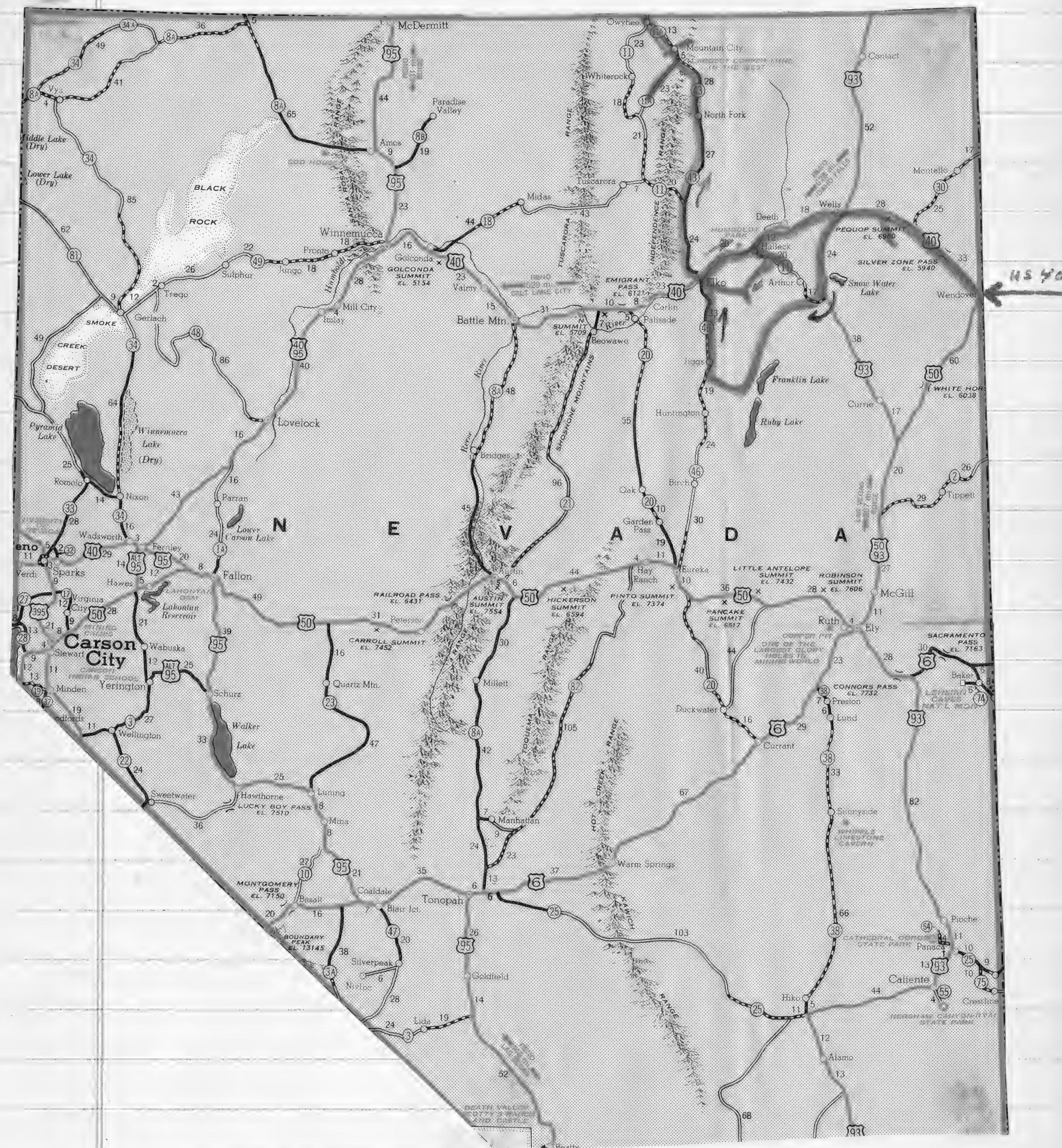
Station 40. Harrison Pass over Ruby Mts, Nev. at top, elev. 7247 ft. Red *Urophodius* and small black *Histerids* + a few *Staphylinids* under cow dung. At first found no larvae, then found a series of very rich clumps, probably yielding several hundred in two hours. (Actually 406.) Many were on very lowest leaves. A few other insects.

At sta. 39 the following *Tycaenidae*:

- L 15 *Plebejus melissa*
 6 *Phaedrotas pius*
 3 *Plebejus icarioides* (1♂, 2♀)
 4 *Lycaena helloides*
 3 *Strymon calanus*
 1 *Strymon titus*
 1 *Satyrium fuliginosum*

The Ruby Mts. seem to be in three parts, with the northeasternmost part called East Humboldt Mts. The pass between these & center section is Secret Pass and between the two others Harrison Pass. I saw only faint indications of the fault scarp along the eastern face. Nowhere did we see any garnets, although the schist was present. The mountains are much more rugged than I remembered them, with water in abundance flowing out on both sides. There are said to be at least two "roads" up canyons on the east side.

The Harrison Pass road on the west side comes out south of Jiggs. The Klicker ranch was not clearly evident, but one was labelled K. I saw no Post Office at Jiggs. The valley to the west is entirely different from that to the east. It's higher and much dissected, better watered.



Spudomiles 11663

June 29

Wed.

Got to bed late last night because we collected until seven and then had to return to Wells where we still had a motel room - nearly 100 miles. Then counted the 426 eggs and prepared for mailing. Mounted part of the many other insects.

Station 41. Canyon on n.w. side of Secret Pass. Elevation 6150.

Probably only 1 species of lupine, but it looks more lush on west facing slopes. Eggs on these; four lupines preserved, one on which eggs were found, others labelled "Host?" An east facing slope probably same lupine, but with more eggs - specimen marked "Host with eggs - east facing slope." 1 ♂ *icarioides*, few miscell. also adults

We had circled west and south and east from Wells past Starr Valley into Secret Pass road, which is newly built and asphalted from the east side to the entrance to the down grade on the west side. Tush park area at top of the pass - el. 6457 ft - extending into several square miles. Much grazing. Several farms.

At Sta. 41 took altogether 30+ eggs, 4 ♂ + 6 ♀ + 15 adults, *Satyrus* common flying. Also *L. melina*. 1 Cicada, Chrysids, 4 spp. of bees, Larid wasps.

Then out onto flats again and 16 miles south to Lemaille. Lunch in a tavern, plus a pony of Curacao and some beer, then to mouth of Lemaille Canyon.

Sta. 41-44

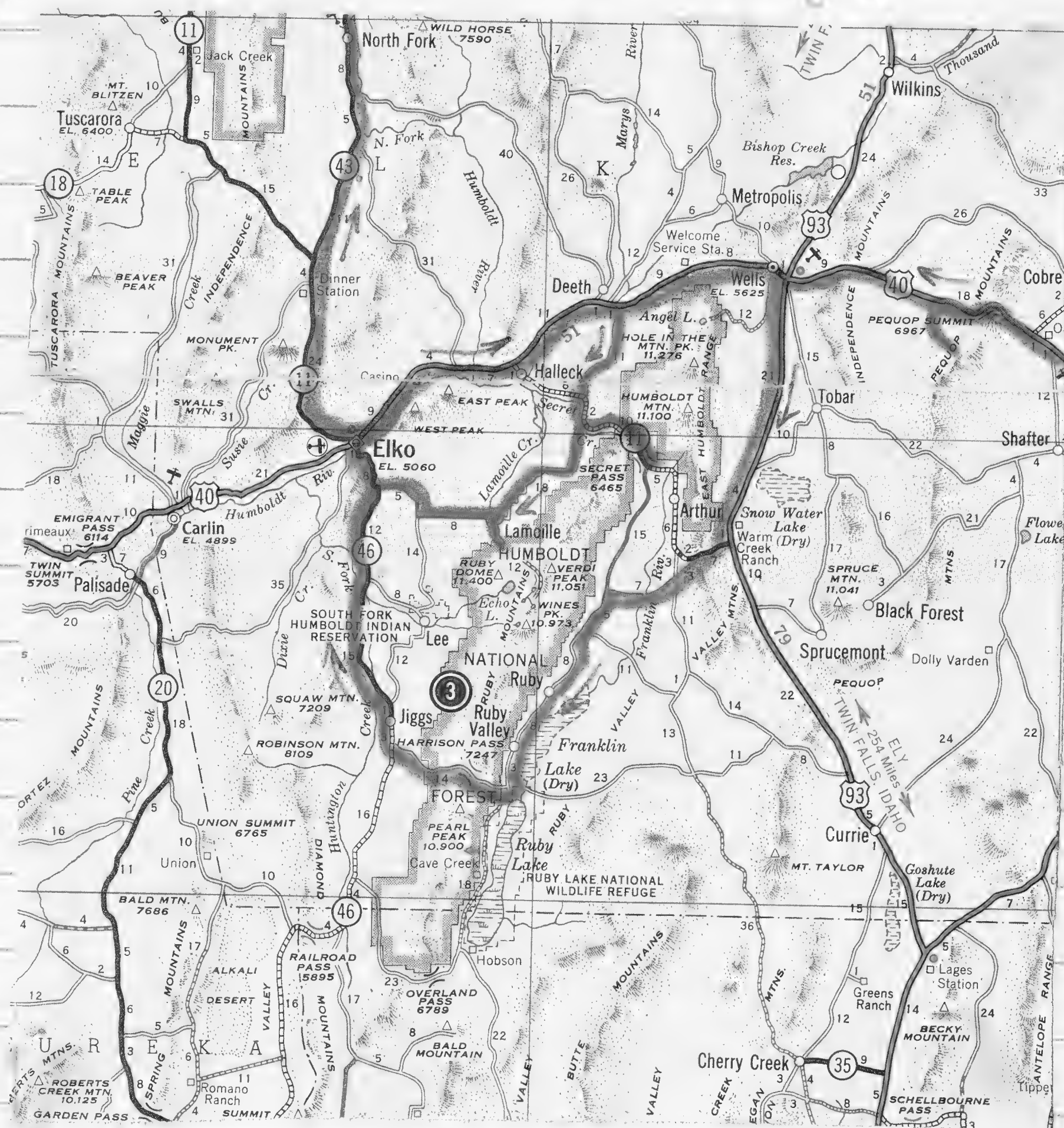
Station 42. Mouth of Lemaille Canyon, n.w. side of Ruby Mts, east of Elko, Nev. Elev. 6175 feet. Sample of a silvery lupine - apparently the host last year. No eggs but much moth (mail larvae) damage. Very dirty situation. 2 *icarioides* ♀, 1 Cicada, 1 Aspid, Vespids, green blister beetle, Mordellids, several "bees", a humble bee, a Chrysids, 2 spp. *Nomadidae*.

Station 43. 5 mi. west of Sta. 42 on sagebrush bench, Lemaille - Elko Road. *Melissa* on clover, sample of lupine, some eggs on it, 1 similar larva. Definitely host.

Station 44. Loby Summit on rts. 11, 10 mi. n. of Elko, Nev. Elev. 6554 ft. A fulvous lupine apparently not same as any last few days. Sample pressed. 4 eggs. Large black Elaterid. Total 7 hatched, 7 unh. At mileage 11830 (60 mi. from Elko) crossed the divide into the Columbia River drainage from the Humboldt River drainage. Elevation 6828 feet. Lupine has followed us from Sta. 44.

From Elko we followed rts. 11, but the newer route 43 and 11A parallels this and we followed it. The mountains are less rugged but are all around. Wildhorse Reservoir is partly in an open valley and partly in a narrowing canyon. Very attractive. Brown rocks appear to be basalt.

Stopped in Mountain City for supper. Saw a new motel and decided to stay. Chevron Motel. We were first ones in Room 1, just finished. Twin double beds for \$8.00. Room 2, has 1 double and 1 single. Very nice for such an out-of-the-way place.



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RUBY VALLEY, NEVADA

Speedometer 11860

Station 45. Mountain City, Nevada. Elko County.

1 large Carabid, 1 *Pantomorus weevil*.

June 30. Were told that Harris Gulch behind town and Thors also rds. 11 4 mi. south had two kinds of lupine. Will investigate. Sent cards to Woodie, Mary Ann, Triggello, and Arnetti.

Station 46. Harris Gulch, 1/2 mi. e. Mountain City, Nevada.

Elev. 5575 ft. Many blues, 3 *Homognathines*, sample of lupine but only 2 eggs. Marked "probable host!"

Station 47. Speedometer 11874, rds. 11 A 10 miles s.w. from rds. 43, 14 mi. from Mountain City. No lupines although everything looked right. *Prun Maloids*, gray *Melgids*, couple of blues but not *icaroides* Clerid. *L. heteronea*.

Turned back to Mountain City for lunch at the Miners' Club.

Proceeded through the Western Shoshone Indian Reservation into Idaho. (Rte. 51 Idaho).

Station 48. 14 mi. s. of Grasmere, Idaho. Elev. 5800 feet.

Speedom. 11933. Lupine sample. A few eggs.

For about 50 miles this is the most barren desert we've seen. Low hills with a slight tendency to form mesas, sandy soil, no flowers, not even sage most of the way. Passed a missile base under construction. Road not paved and very dusty.

Gas at Mountain Home on US 30.

Decided not to go to Boise, so took US 30 east to Bliss, paralleling hills on the north that seemed to be capped with lava. A sign among the sparse sagebrush said, "Sagebrush is free, stuff your car with some." From Bliss east to Shoshone and then north. Here we crossed real lava flows, very rough. Saw very saw-toothed mountains ahead and to the right, but they can't be the Sawtooths. Stopped at end class motel at Hailey.

Lycaenidae from Harris Gulch, sta. 46:

Plebejus icarioides 12♂♂, 6♀♀

P. melissa ♂♂

P. acmon ♂♀ very common

Phaedrates pius ♂♀ most numerous

Lycaena heteronea 1♂

Philotes battoides 1♂

Satyrium fuliginosum 1

Plebulina emigdionis 1 (? new state record)

Other Lepidoptera:

Cercyonis sp.

Colias sp.

Euphydryas sp. (maybe 2 spp.)

Glenonympha sp.

Phyciodes sp.

Speedometer 12129

July 1. Breakfast at Ketchum, entrance to Sun Valley.

Fri. Station 49. 9 mi. n. Ketchum, 6300 feet, on rds. 93.

5 eggs on lupine. Little flying: 1 Coccinellid and 1 Chrysomelid. Lupine sample - host.

Station 50. South of Malena Summit on U.S. 93.

Elev. 8500 feet. Speedometer 12174. Many large green

Lythys, 4 spp. blues but not common on this wind-swept hillside. 2 *icarioides* stalk eggs per 100 stalks.

3 *ligdamus* eggs per 75 buds (mostly partly in flower).

Some of the lupines almost pure white, stalks often a foot long, large open clumps. Also *Eraxes*

cameraria + *Phaedrates*. Samples of lupine of both white & pink flower. Seem to be same. Two large reddish *Elaterids* on lupine. 2♂ + 2♀ of *icarioides*, one female kept alive.

Drove over Malena Summit and down into valley along east side of Sawtooth Mts. Up to Alturas Lake and a half mile beyond. Ate picnic lunch.

Speedometer 12192.

Station 51. miles w. of US 93, just above Alturas Lake.

4 large *Tachinids*. 2 *Aeneis*, 4♂ *icarioides*, 2 lupines present + collected, A+B, B is hairy + John feels it is the host. He took 2♂ + 2♀ in obvious association with it. More than 50 stalks examined without any eggs.

P. A. uncommon, about 20 stalks - no eggs. *Brentius*

(*Boloria*) 2, *Plebejus sapius*, *Lycaena cupress*, 1 *Clerid*,

1 *Cerambycid*, few others.

(cont. over)

Continued to collect down to the lodge, 4 miles, taking additional males. Several *Aulids*. Collected two more lupines, C in a dry pasture, D a very low sparse plant down in the flats.

Station 52. 9 miles west of Stanley, Stanley Lake, end of road, northwest corner of Sawtooth Mts., Idaho. 6500 ft. elevation. 9 ♂ + 4 ♀ *icarioides*, 1 *helloides*, 2 spp. of *Cerambyrid*, 1 saw fly, 2 robber flies. 115 eggs. The lupine here was very variable, sometimes being wide-leaved and pubescent, sometimes narrow and glabrous above, sometimes stalked and sometimes with leaves growing from base directly.

Many *Phalaenid* moths flying among the flowers. They made it difficult to spot the blues.

We drove through some rather fantastic country today. Sawtooth Valley is broad and long with many lateral moraines coming down out of the Sawtooth Mountains, each heavily forested with pines. The east side of the valley looks like a continuous series of landslides, but looks also like the terminal moraines of all the glaciers, with the flat central valley the result of stream erosion. The rock seems to weather quickly, but the hills that are bare have a topography that looks like no stream erosion pattern.

The valley is drained to the north by the Salmon River. The road goes down this canyon for 50 miles or so. This canyon alternates rough & craggy red and brown rocks that are sometimes stratified but upturned and folded on a large scale - and the barren hillsides, rounded and hummocky. There are a few cliffs but many very large talus slopes. The canyon bottom is narrow and winding, the stream large and swift. Rocky knobs protrude from the rounded hills and only the high peaks have pine trees, - the rest have an olive, greenish, or yellowish tinge to the brown, no sage, and apparently little other vegetation.

16.9 mi.

July 2. Station 53. US 93 7.2 mi. n. of Gibbonville, Elev. 7525 ft. Sat. Below Lost Trail. 18 ♂ + 8 ♀ of *icarioides*. 1 *Clerid*, 4 bugs, 2 *Agrilus*. 23 adults. 2 sawflies on lupine.

Station 54. US 93, 3 mi. below Lost Trail Pass. One yellow *Cerambyrid* on large *Thlasia* heads. Also a *Clerid* and a *Coccyzomyia*.

Station 55. 6.7 mi. n. of US 93 on Twin Lake Road. Elev. 7500 ft. Adult *icarioides*. Darky, Montana, a few eggs also. 1st. The pine in marsh.

"Lost Horse Road No. 429"

Station 56. 6.7 mi. w. US 93 on Twin Lakes Road. ~~Alt~~
Elevation 1250 feet. Adult *icarioides* (21 ♂ + 4 ♀),
Plebejus argyrognomon ♀, *P. sapiolus*, *Erebia*
bombus-like-mimicking *repperfly*. 3 females kept
alive. *Heliconia californica*. This looking entered 2 miles,
200 feet elevation.

Station 57. 2.2 mi. east (down canyon) of sta. 56.

Elev. 4075 ft. Broad-leaved and very hairy silvery
lupine. 2 eggs on 15 stalks. 6 adults (3 ♂ + 2 ♀)
Bumblebee and fly similar to it. Large yellow jacket.

Station 58. 4.4 mi. east (down canyon) of sta. 56 or

2.2 e. of sta. 57. Elev. 3900, out of canyon on alluvial
fan or moraine. (Assumed to be same as at 56.) A large glabrous lupine. Took
samples and photo. No eggs, no adults. 3 *Eledes* on road.

Saw a large badger, big face black and white
and furry. He was digging a fresh hole.

Today we followed US 93 from Challis, Idaho, on
down the Salmon River Canyon to Salmon and to
North Fork, where the river turns west and the
road turns up the North Fork of the Salmon River.
At the top crossed over Lost Trail Pass into Montana and down
into the Bitterroot Valley. Went up a side road
west into the foot of the Bitterroot Mts., then on
to Hamilton (Rocky Mt. Lab. of USFS) and Missoula
(Montana State University). Stopped at the
Spear Motel on south side. All bottles filled up.

Blues, not identified — 7, 8

Lycaenidae:

Plebejus icarioides — ^{72, 73, 76, 78, 80, 83, 85, 86, 87, 88, 92, 93}
^{SL} 4, 11, 13, 14, 17, 18, 21, 34, 37, 39, 41, 42, 46, 50, 51, 52, 53, 56, 57, 61, 62, 63, 64, 66, 67, 68, 70, 71,
melissa — ^N 19, 21, 22, 30, 38, 39, 41, 43, 46, 61, 63, 67, 68, 70, 72, 75, 78, 79, 80, 81, 82, 83, 88, 93
acmon — ^{U N M W} 25, 46, 62, 66, 70, 72, 73, 76, 84
sapiolus — ^{I M} 51, 56, 60, 61, 68, 71, 72, 73, 79, 80, 84, 85, 86, 88, 93
argyrognomon — ^M 56

Phaedrotas piasus — ^{C U N I M W} 4, 11, 22, 39, 46, 50, 61, 63, 66, 67, 70

Glaucopsyche lygdamus — ^{C U M} 4, 11, 24, 66, 67, 68, 70, 71, 84, 85, 88, 92, 93

Lycaena belloides — ^{N I W C} 39, 52, 70, 92 *L. hypophloeus* — ^{W W} 79, 83

cupreus — ^{I M} 51, 68

heteronea — ^{N M W} 47, 46, 62, 67, 70, 72, 73, 80, 83, 87, 92

editha — ^{M W} 62, 73, 80, 83, 86

rubidus — ^W 76, 80

Lycaenopsis pseudargyroides — ^U 11

Callipsyche behrii — ^{SL} 25

Strymon melinus — ^{SL} 19, 21

calanus — ^N 39

titus — ^{N M} 39, 62

Plebulina emigdionis — ^{N W} 46, 79

Callophrys sp. — ^{SL} 20

Satyrion fuliginosum — ^{N W} 39, 41, 46, 70, 73, 78, 87

(Phyciodes) sp. — 20

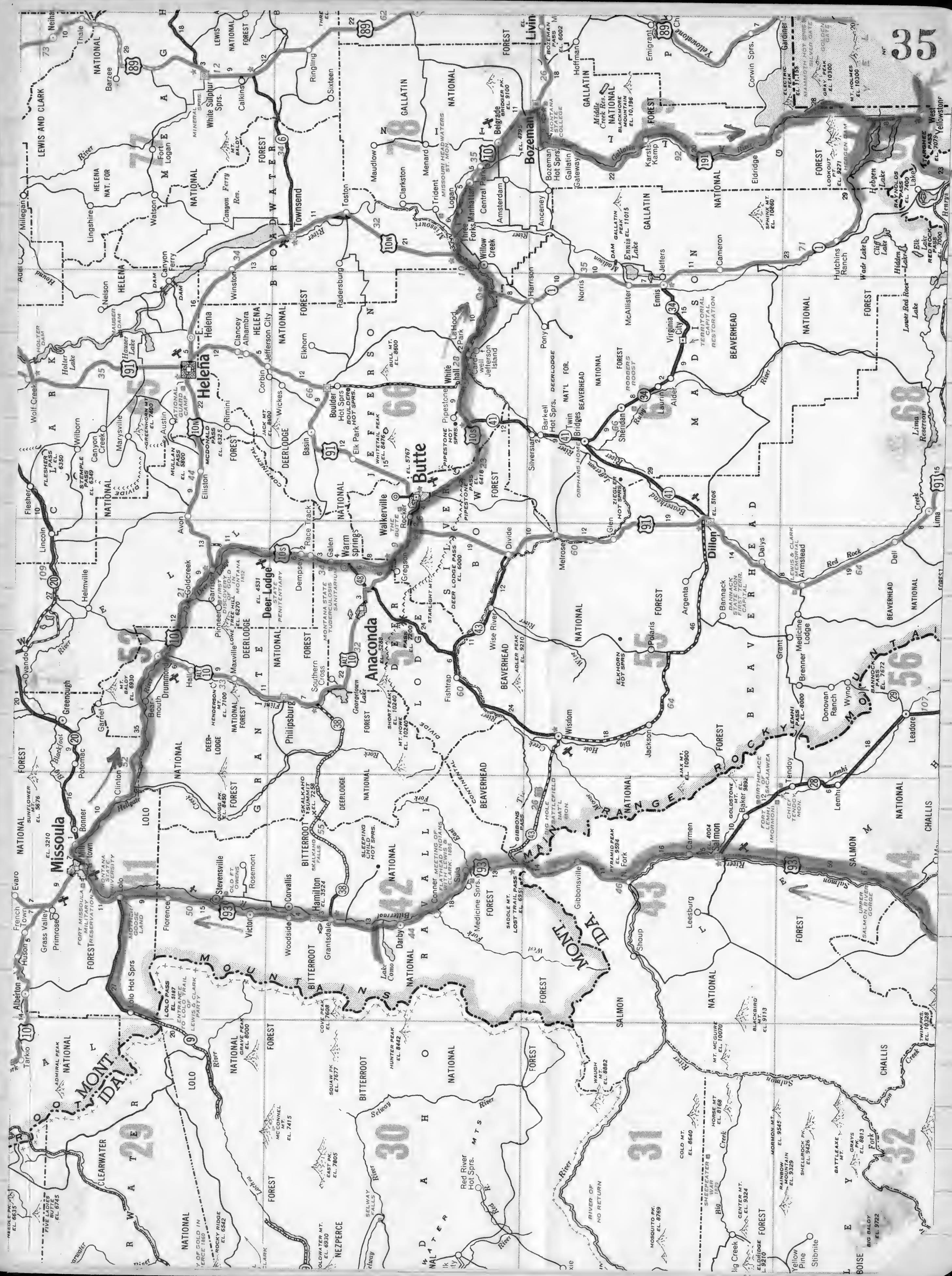
Philotes batoides — ^{U N M W} 21, 25, 29, 46, 67, 70

Everes comyntas — ^{U I W} 21, 24, 29, 50, 68, 79, 84, 85

Agriades glandon — ^{M W C} 68, 72, 88, 93

Mitoura siva — ^U 30

Sp. — ^W 85



July 3. Station 59. Tolo Pass, Bitterroot Mts., elev. 5187 feet.
Sun. 1 Cicada, 1 Stratiomyid, 1 Bombyliid, several Syrphids,
Cecidids under stones, Amelanchier on flowering shrub.
1 Celerid, 2 Chrysomelids, 2 Polygonia, 2 moths ^{white},
1 Aglais milberti. Only 2 or 3 lupines.

Station 60. 4 mi. e. of Tolo Pass, Bitterroot Mts. elevation
4200 ft. 5 P. sapientus, 1 Erebia, 2 yellow Colias, 2 Agrius.
Tupine scarce & only around wet bank.

Station 61. (17 mi. e. of Tolo Pass) 5 mi. n.e. Tolo Hot Springs.
Elev. 3700 feet. Excellent general collecting. Cicadas
Cecidids, golden Cerambycids, mayflies in alcohol. 4 eggs
and many adults of icaricides, pisces, sapientus, and
melissa. Colias, Euphydryas, Chrysides, Coenonympha
Red Elaterid on lupine, green stick beetle, green Cupressid.
Tupines abundant on very steep slopes among
dense pine & heavy hemlock.

Station 62. US 10, 40 mi. e. of Missoula, Bearmouth,
Mont. 3900 ft. elev. Few eggs, all on upper leaves
and top side. Many lupines in open fields, 11 ♂ 20+ ♀
Strymon tithys, Lysaena heteronea, P. acmon, 3 Coccinella.
Lysaena editha. 2 Antids with white abdomen,
2 Myrmelconids, 1 assassin bug.

Along the Tolo Pass Road we saw a young moose
and a deer. Also a grouse family in the brush,
with the mother scattering through the grass
to lead me off at right angles to the others.

Station 65. Bozeman, Mont. 1 black & white Celerid moth on ^{thrust}.
After the side trip to Tolo Pass, we returned to
Missoula for lunch and then started for Bozeman
via US 10. Stopped only for sta. 62 and arrived
in Bozeman at 10 p.m. without supper. All motels
filled, but got a ground floor hotel room with
a bathtub (?) in a hotel, and a snack in a
"greasy spoon."

July 4. An early start was delayed by finding 100 eggs
Mon. laid overnight by live females. These had to be
isolated and packed for mailing.

Wrote letters to Meren and Ruth during breakfast,
then realized the P.O. would be closed. This will
endanger all the eggs. (Not in dark room and just caught a plane.)
Elev. 5000 ft.

Station 63. 20 mi. s. of Bozeman, Mont. 2 mi. s. of P. Henry.
Open roadside pasture, much lupine, few eggs,
12 ♂, 18 ♀ icaricides, melissa, Phaedusa pisces. ~~2~~
kept alive. Celerid, Reduviid, Bombyliid, Coccinellids,
yellow Cerambycids.

Gallatin Canyon is near the place that had the
bad earthquake, flood, and landslide last year.
We may be able to go up and see it. This is a very
pretty pine covered V-canyon, beautifully green,
with nice green flats, a roaring river, rocky
cliffs occasionally. (Not a book instead, with
photographs from many sources, and will send
it to EB.)

Station 64. West Yellowstone, ~~Idaho~~ Montana.
1 ♀ *icarioides* and a *Coccinellid* on sidewalk under of town.
(the latter in with sta. 66.)

Station 65. See top of p. 37

Elev. 6650 ft.
Station 66. 1 mi. n. of West Yellowstone, Mont. on Rt. 191.
Small pines with much lupine, extremely variable
or mixed species. 50+ Eggs, ♂, ♀ *icarioides*,
Two main spp. of lupine occur here. The host plant appears
to be quite variable, in flower color, hairiness, and size
of leaf. Samples of some of these variations were taken, but
eggs were found on all hairy varieties. 37 eggs/180 stalks
of non-host lupine, no eggs/150 stalks examined.
Other *Tyramidae*: *Lygdasmus*, *serena*, *piasus*.
2 black *Meloids*, 3 small brown *Scarabs*, 1 *Dryinid*.

This was not the locality we were heading
for - Red Cliff Forest Camp. We missed that one
coming down, and the ranger station says it's
41 miles n. of West Yellowstone. John got many
eggs at Red Cliff last year but no or few adults.
At sta. 66 we got the minimum sample of adults
(♂ and ♀) and at least 50 eggs, as well as 3
live females which may produce more eggs
for us overnight.

100 mi.
We got a motel before going out, to be sure that
they weren't all taken, but the exodus is now on
and we probably needn't have worried. At 4:30
it began to rain, so we came back to town, got
haircut and the camera fixed, looked at a
dozen curio shops, had the car oiled & greased, and
had two chicken salads for supper. Sped. 12911.

Total eggs shipped home so far = 1040.

July 5. With the holiday over things are quieting down.
Tues. The "shaking" kept us awake a while last
night. Put a batch of laundry in a laundry mat,
so have an hour to kill and will run out to the
1959 earthquake & slide area.

Station 67. Helgen Reservoir, north side, 20 mi. n.w. of
West Yellowstone. *Carabus* on road. Many lupines
and many blues flying. *icarioides*,
melissa, *piasus*, *Lygdasmus*, *batoides*?, *Tyasa heluona*,
Speyeria, *Parnassius claudius*, *Erebia*, *Coenonympha*.
Tachinid mimicking humble bee, 2 *Cerambycids*. Eggs
12/24 5/33. Lupine sample.

The road to quake area was temporarily closed.
Photographed a large rift which fell 20 ft wide
10 ft or up side, having gaping cracks yet. We
did pass several miles of smaller "fault scarps"
which also have been mostly cracks. Also one of the
three large breaks in the highway, where it
collapsed into Helgen Reservoir.



EL. 6975 ft.

Station 68, 3 mi. up Red Canyon, n. of rde 1.
 Narrow valley in pine woods, many flowers incl. lupine.
 Black and other butterflies everywhere. *Idem* *idem*,
 (most common) *Lygdamus melissa*, *Agriades glandon*, *Lycaena niphon*,
Eures comynus. Also *Anthocharis sara*, *Euchlaena aus-*
onides, *Eubia* sp., *Ctenis* sp., *Boloria* sp., *Pieris napi*,
Satyrus sp., *Physodes* sp., *Speyeria*, *Parnassius*
cloidus, *Polygonia calyrops*. Only 1 *Idem* *idem*, many *Idem*.

82 blues
 altogether

In this same side canyon west of the main Red Canyon, we saw a grizzly bear on the hill-side. Had a light hand over the shoulder. He looked at us when we whistled but there was no alarm. The high cankers and rocks in the road made driving this very low car difficult. Several very large boulders obviously came down during the quake.

Up on open steep flower-covered hillsides, I thought that the open ground between the plants, due to creep, was more evident than usual. Might have been imagination.

Half a mile above where we stopped, there is a large yellow gash running across an open mountain face several hundred feet above the valley. There were so many trees that we couldn't get a photo, and so many blues we didn't have time to explore. Called Red Canyon Fault Scar.

At Caldera Bay we went to get a cabin - \$15. each! So we looked at the tent houses - \$5.00 with no screening but bunks with foam mattresses. We got the last one. Then went back down to watch them put the boat back in the water to adjust it on the trailer. Took only half an hour, although it had to be done with a long chain so the car could stay out of water.

Had supper at the large cafeteria with the Ivers's and Mike's girl friend Norma. While the rest had a beer, Mr Ivers and I stood outside and talked. He had been in the Sawtooth Valley in 1903, had mined in many of the mountains, and now lives on a 24 ft. cruiser - Lake Meade in winter, Jackson Lake in summer. He once hired a man who had driven a wagon from Salt Lake to Yellowstone and the Tetons in 1889, painting water colors all the way and keeping a journal, a copy of which he had given to Mr. Ivers. Ivers was until recently a member of an exclusive hunting club owning many thousands of acres of marshland around Bear River in northern Utah. The members were all millionaires - mostly multimillionaire oil executives, Ivers said too rich for his money. But he was president of it just before he got out. The members mostly flew in in private planes, getting two days hunting per week end.

July 6. Station 70. Spring Lake, Grand Teton National Park, Wyo. Elev. 6750 ft. Two species of lupine - the host ^{1 line 2} silvery pubescent, the other glabrous. *Parasitica* but few eggs, *Lygdamus*, *pinus*, *melissa*, *acron*, *heliothis*, *heteronea*, *patricides*, *Lat. fuliginosum*, 4 cicadas, 3/50 and 2/25 egg/stalk count, other Lep. = *Ctenomympha*, *Anthocharis*, *Satyrius*, *Euphydryas*, big brown buck moth, *Parnassius clodius*.

Stopped at Moran P.O., all that's left of Moran, 1/4 mi. east of turnoff of sts. 26 + 287 and 187 + 26 south. About 15 miles farther east stopped at the Hatchet Restaurant which is quite nice and has a large attractive motel, Standard gas, and store. This is called Moran, Wyo.

Crossed over north of the Wind River through Togwotee Pass, 9658 ft. elevation. Spectrometer 13172. Saw a young elk, the first outside of the Park. About 20 miles back saw a coyote crossing the road. Looked awfully rangy.

Station 71. 3 mi. east of Togwotee Pass, elevation 8500 feet. Glabrous lupine, 1 egg only. *Parasitica* ♂ + ♀, *Lygdamus* abundant, *sapiens*, *Anthocharis*. It was sprinkling fitfully, apparently the remnants of a shower on the west slope. Sample of the lupine, which grows very dense, is crisp and entirely glabrous.

Coming into Dubois, there was plenty of sage but little or no lupine. Reddish-yellowish beds appeared on the northwest side, no vegetation and considerably carved. Almost badlands. The most craggy ridge of the trip was on our left as we crossed the pass, and the back side of the Wind River from Dubois is rounded, drab, and forested only in spots.

Elev. 7650 ft.

Station 72. 3 mi. w. of rte. 26/287, road to de Vair. Lupine host but not very hairy or silvery. ^(m) Two eggs, *icarioides* 8 ♂ 5 ♀, *Agriades glandon*, *almon*, *melina*, *sapichus*, *T. heteronca*.

195 mi. Passed a lot of bad land coming by getting to Tander. Browns, reds, and greens. Sage sparse but dry without lupine. The hills to the west appear to be sloping strongly away from a jagged crest, as on the south side of the Wind Mts. It must be twenty-five miles back in to the real base of the Wind River Mts.

Tander is a strange little town of a couple of thousand people, serving the Wind River [Shoshone] Indian Reservation. Has several AA motels, a Dunbar Hines hotel (Noble Hotel) with coffee shop, five drug stores, a wide divided main street, a rodeo, and several Indian artifacts among the trinkets. Coffee shop has interesting murals and historical objects - also Indian signs.

July 7.

Thurs.

Left Tander to make a side trip into the south-east corner of the Wind River Mts. up Middle Fork.

Station 73. 12 mi. S.W. of Tander, Wyo. Elev. 7000 feet.

Sinks road. Lupine very old, few eggs. Adults plentiful on dusty road. *Dracoides*, *sapichus*, *almon*, *T. althia*, *Satys fulig.*, *T. heteronca*. 9 cicadas, dark *vicinella*, 1 *Clend.*, 1 *Telephorid*. Egg count 1/33.

Seeds collected.

Northwest from Tander to Princeton, then past a fairly new reservoir in the badlands south of a range of hills made of silted beds. Found that the Wind River runs out through these hills in a sharp rocky canyon.

Station 74. 6 mi. S. Thermopolis, Wyo. Elev. 9800 feet. Crambled on milkweed, 2 *Myzochelid*, a *Spereria*.

This is at the point called Wedding of the Waters, where the Wind River and the Big Horn meet, or rather the stream is called the Big Horn after it leaves the Wind River Canyon.

We've been following rte. 789 from Tander and US 20 from Chashoni, and will turn east on US 16 at Warland.

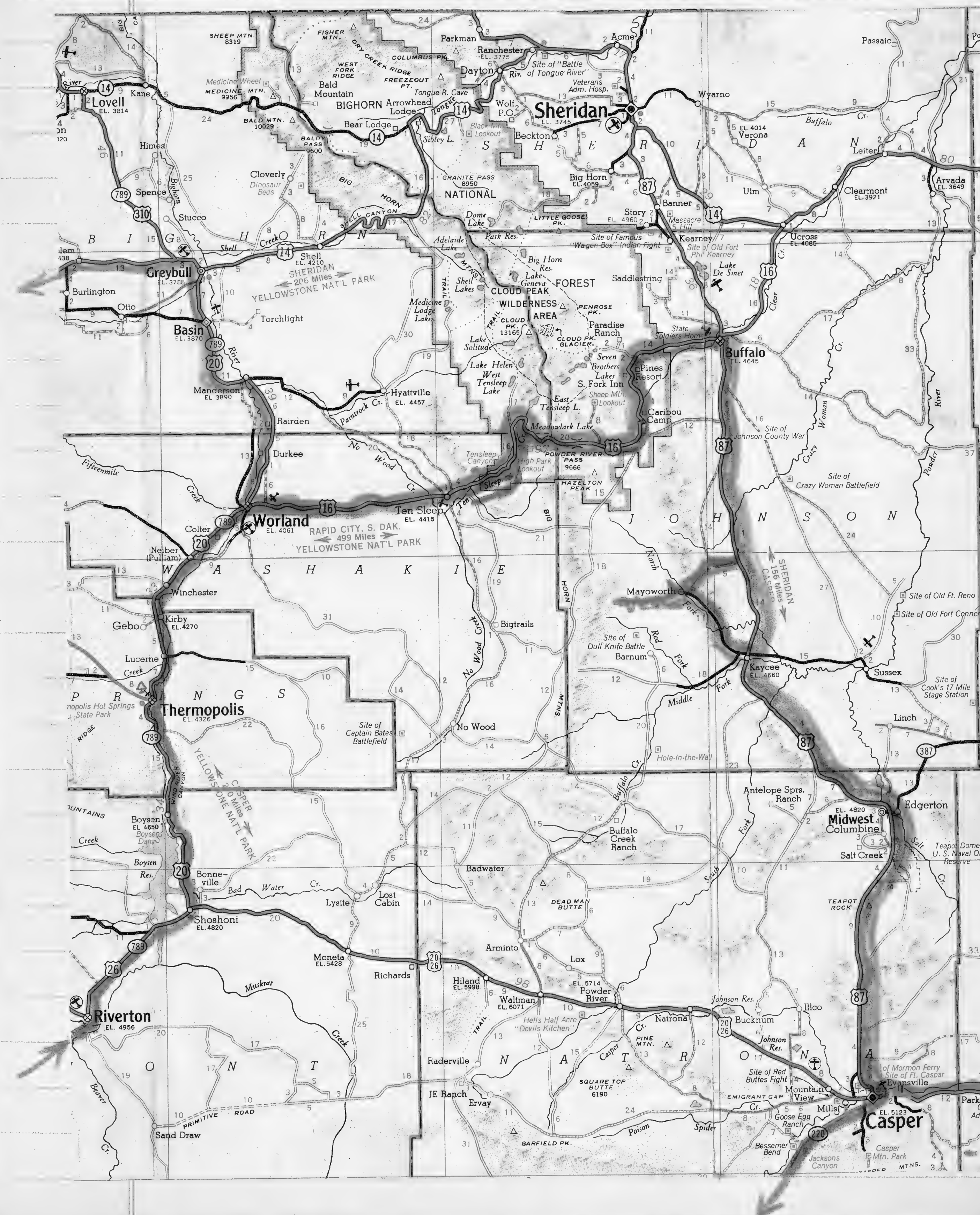
Station 75. Ten Sleep Canyon, Elev. 6300 feet, 10 mi. e. of Ten Sleep, Wyo. Glabrous lupine very scarce but found 5 eggs out of 55 stalks examined. No adults of icarioides in spite of eggs. 2 melissa, Polygomia, Pieris biquantri, ladyras, Phyciodes, 2 black-and-white moths. 1 Ceanothid (small), red Thorne Meloid, elephoids, small black Coninellids, Ailids, 2 Cicadas, small tree hoppers & Ailids (on Ailids) flies on thistle. Went back down the old road for 5 1/2 miles; it is on the other side of the canyon (south or east) and is in good repair. Saw only one or two lupines.

Station 76. 2 mi. above sta. 75. Elev. 7725 feet. Lupine abundant, but there was rain here within the hour and only 3 blues were seen, - 1 icarioides, 1 acmon, Tysaena rubidus. 1 Spayaria, 3 Corydalids, and a black larva under a locust spin. Lupine sampled.

Today we saw buffalo (bison) near Worland and a fearless doe in Ten Sleep Canyon. No porcupines.

Continued on over the pass, 9,666 feet, and found lupine in prime condition in great profusion under pines. It continued thus for about 15 miles. Then occasional lupine, perhaps of one or more other varieties, right down into the flat at Buffalo, Wyo. Town of 2500, at 4600 elev. Stopped at Mountain View Motel (cabin) AAA.

In the evening we made the rounds of the



Bright lights, likewise, to see what insects were flying. The only good place was a white lining Queen next door to the motel, where

Station 77. Ba Halo, Wyo. 4600 feet elevation. At
lights, 1 large black and white moth, an *Ergates*,
1 *Polyphylla*, 3 *Trox*, many *Trichoptera*, and
2 *Ephemeroptera*, 1 Meloid black *Epiranta*.

July 8. Up early, and to Bath at breakfast, took partly full
Fri. of 244 gun stamps to John's mother, then on the
road at 2:30 for arrival trip back into The Big Horn.

Station 78. Clear Creek Canyon, 9 mi. W. of Buffalo,
Wyo. ^{alt. 6500 ft.} ~~Tupine~~ along road only. 1 egg. 3 icaroides,
~~melissa~~, 2 fuliginosum kept alive, also 1 icaroides ♀,
1 Speyeria, Ceraurys, black Meloida.

Station 79. Elev. 7500 ^{14 mi. up} in same canyon. Many blues especially *melissa*, *E. comynata*, *typhaea hypophylla*, (*icarioides*), *sapioides*, *E. amygdales*. No lupine sample.

Station 80. corner of Buffalo, same canyon, elev. 2700 ft.
A standard sample of *icirivides* but we had to struggle
to get it. No eggs. Many small *Crambids*, 2 *Acridula*,
2 *Clerids*, 1 *Agrius*, 1 yellow + black *Cramboid*, a
Hymenopt. + 1 ♀ *icirivides* kept alive. Also 1 ♀ *editha*.
I. rubidus, *I. heteronea*, *sapiolus*, *melina*.
Erebria, *Speyeria* sp., *Papilio*.

Station 81. 4 mi. n. of Mayaworth, Wyo. 11 mi. n. of US 87.
Elev. 5650. ^{st.} Sagebrush hills one mile out from ^{S.E.} spur
of Big Horn Mts. (southern section). Fair lupine on
southeast slopes & gulches. No eggs, no icaroides; 1 ♀ malinica,
6 black Ceraxonis. Lupine sampler + pda collected.
2 Carabids on ground. 0/50 stalks.

On the back of one of the hogbacks at 5675 feet on the western bench of the road, and aside I read into the red beds, succeeded a belt of slate-like but cherty beds all broken off in flat pieces. No fossils.

Where this road meets the end of a paved road, there is another gravel road turning west. After half a mile or so this swings back to the northwest, evidently heading up the valley between the spur and another section of the Big Horn. Just as the red beds appear, there is a road keeping due west. It passes over the slaty beds described above, over the contact of the red beds, across a valley, and up a ridge by means of 22 switchbacks. We probably didn't get near the top, very steep and rough. Canyons on each side of the ridge; pine trees; no lupine. Beautiful view each over hogbacks. The red beds evidently underlie the northern section of the mountains and underlie the southern. They were also seen at the west entrance to Ten Sleep Canyon.

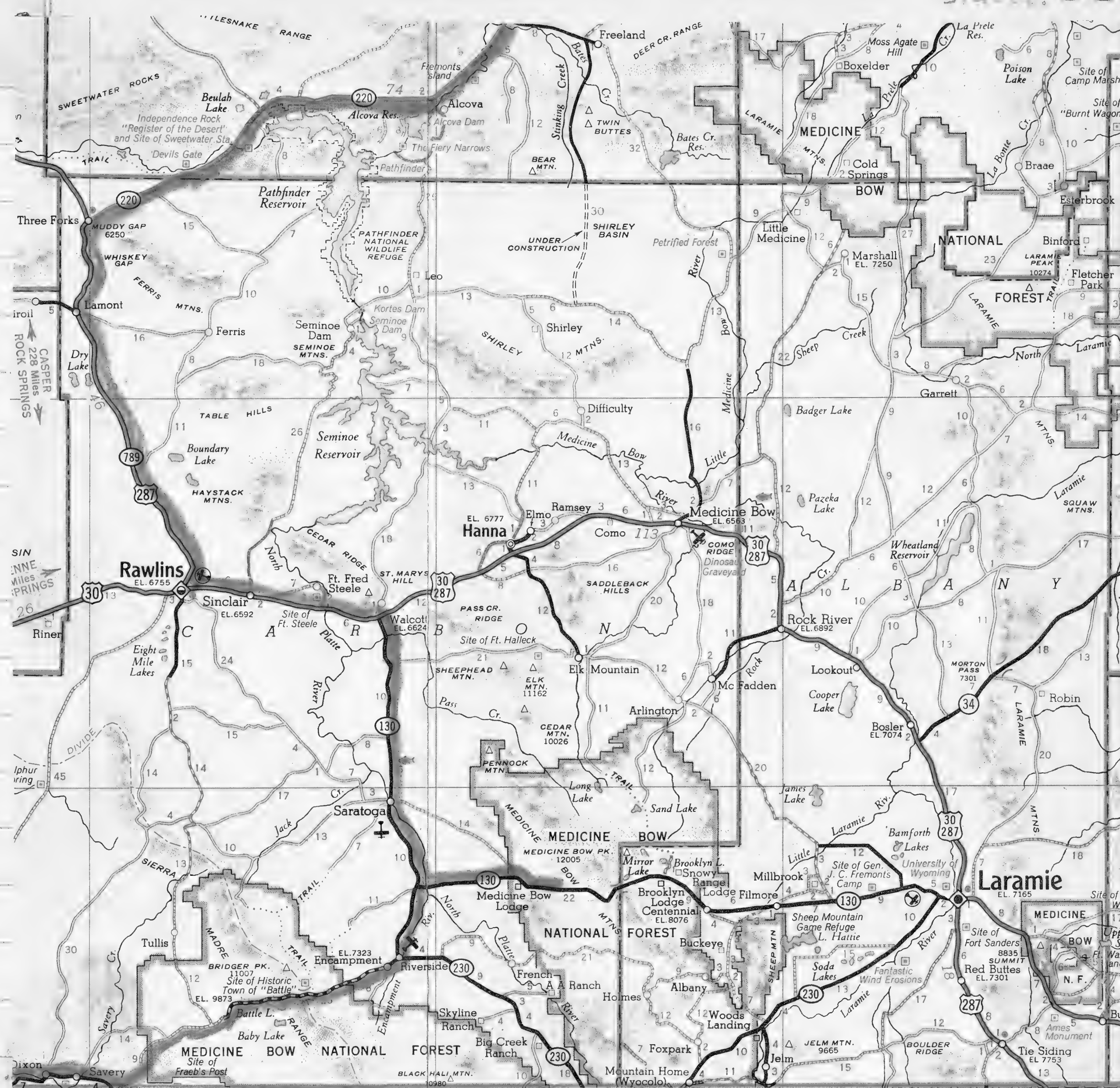
Station 82. 10 mi. n. of Mayaworth, Wyo. Elev. 6850 ft.
 Melissa, 1 gray *Epicauta*, ^{green} dragonfly, black-and-red
 McLeod, house fly, hymenopt., cicadid.

At Midway, down US 87, we came upon an
 extensive active oil field, and just south of
 this passed Teapot Dome and Teapot Rock.
 Shortly thereafter we entered a region of
 sharp craggy hills sticking out of prairie.
 They look like intrusive blocks left by
 erosion. In the south background were more
 extensive mountains.

Casper is on the North Platte River on the north
 flank of an east-west range of hills. It has poorer
 road signs than any town we've seen. It's not
 on any tourist route, but it's a small city.

Southeast of Casper we passed Independence
 Rock, which is a very large exfoliated dome, appa-
 rently granitic (igneous, feldspar and mica)
 with the foliation 12-15 inches thick. It is now
 fenced off, with several historical plaques. The
 Mormons came by here, and many others in the
 early days. Nearby is Devil's Gap, a short cut
 made by the river.

After a region of rolling bad lands, we
 came through a gap between the Ferris
 Mts. and the Green Mts. (W. side). On the south
 face of Ferris Mts. just outside of Whiskey Gap,



were a row of hogbacks, very steep, over 100 ft. I think,
 with the south slope composed of a smooth sur-
 face all in one plane. This surface is cut up into
 square blocks like pavement. John took two
 photos. Many pronghorns along here.

In Rawlins stopped at AA Motel on 9th W. n. of US 20.
 Had supper & breakfast at Adams Restaurant; very nice
 but also very popular & therefore not quick.

July 9. Post Office open at 9 a.m. Letters from Ruth, Edith, S.B. and Noreen.

Station 83. 1/8 mi. east of Mts. 130 ^{s. of} Saratoga. El. 7900 ft. Three lupines, A, B, C. C has very broad leaf, had eggs on 3/6 stalks (Lowrey thinks B. narrow is same as C). 0/25 TDB on B, JCD found eggs on B. 2 *icarioides* ♂, *heteronea*, *T. hypophloeus*, ^{Editha} *melissa*. *Colias alexandra*, ♂ *Cerambyx*, *Heffly*, etc.

Station 84. 2 mi. above sta. 83. Adamp roadway. ^{5050 ft.} 3 more *Colias*, 2 *Cicindela*, *Lygdamus*, *comyntas*, *sapiolus*, many flies, beetles, *Stenomyzids*, *Chrysids*, *Coccinellids*, *Meloids*. [+ *Raphididae*, *Cicada*, *acmon*, *Cenomygma* ^{Satyridae}].

Station 85. 4 mi. above sta. 83. Along road in pines. Elev. 8400 ft. Lupines look similar to C of sta. 83. Horaflyes, deer flies, Asilids, *Perils*, *Cerambycids*, etc., etc. *Sapiolus*, *comyntas*, *icarioides* 1 ♂, 1 ♀ alive *Lygdamus*, *Mitoura* sp.?

In this 500 ft. range of elevation, from open sage brush flat up into dense pine woods, the lupines seem to be the same - the *Editha* broad leaved sp. C. *icarioides* occurs in the pine area but very sparsely. Walk by the sage flat again, where all the "indicators" are present: *Balsamorhiza* (mule's ear), *Castilleja*, *Eriogonum*, sage, *Penstemon*.

Station 86. 7 mi. e. of Mts 130 s. of Saratoga. Elev. 7600 ft. 5 ♂ 1 ♀ alive. 3 eggs/12 stalks. *Editha*, *sapiolus*.

Station 87. 9 mi. w. of Tenneride and Encampment. Sierra Madre Mts. 8700 ft. *Satyr. fuliginosum* 1 small *icarioides* ♂, *heteronea*, 3 *Cicadas*, ant lion, 1 *Cerambycid*, 8-10 green *Dytisc*, *Elaterid*. *Basilearchia* *medemeyeri* ^{above Battle Lake}

Station 88. Top of pass s.e. of Bridger Pass, elev. 9916 ft. Lupine rank in large fields exposed on west slope. Stiff breeze and low temperatures at about 5 o'clock. ⁽²⁰⁰⁾ *Passaluna* *Battle Lake*. Blues were not flying at first but could be clearly seen resting on the lupine flowers. They could be picked off by hand, or observed so closely as to be positively identified. This pass is 15 mi. from Encampment and 26 mi. from Slater, Colo., which is also 15 mi. from Baggs and Wyo. Sta. 289 (Colo. Sta. 13).

Station 89. Edge of Medicine Bow National Forest, 10 p. 57 } mi. e. of Savery, Wyo. S.W. corner of Sierra Madre Mts. Elev. 7500 ft. Lupine + sage flat, lupine variable. No blues. 12+ eggs. 5/12 stalks on a hairy variety. Found a dead *Pieris protodice*. 1 cluster of *Vignemont* parasites. Inst. *icarioides*, *Lygdamus*, *P. sapiolus*, *P. melissa*, *Agrotis glandon*. *Colias*, *Hecla*, *Ceneis*, *Speyeria*, *Parnassius clodius* + *aminthus*. No misc. insects except 3 sawflies.

See also Sta. 91, p. 58.

The Sierra Madres brought back few memories from my 1925 visit (35 years ago). The pass is at least a mile from Bridger Peak, with no sign of a road or even trail over to it. Couldn't see whether there was a fire lookout on top. Didn't see the old aerial tramway that ran southward across a rocky valley. The mountains can't be seen much from the northeast, but they must be more prominent from the south. They give a grand view of the mountains in northern Colorado, exaggerating their size.

Just over the pass, going a little south of west, a steep slope leads several thousand feet into a beautiful green valley, park, with a lake several small moraines, large meadows, and some roads. The only road that could have led to it was unmarked but was only five miles or so below the pass. This is one of the most attractive spots we've seen on the whole trip.

July 10. ^{Sun} Drove up to the Pass again, it drizzled just as we reached it, then the sun came out slowly. Took about 20 *icarioides*, before the wind rose about 1 p.m. Same as sta. 88.

The lupine collected on the pass yesterday and marked "non-hart" is the host for *Glaucospyche*, which I.D. watched overwintering on the buds. Today took samples of the non-blooming variety of lupine, which is in large beds separate from the fields of blooming ones and also scattered among them.

I walked around a small hill at the pass and found the road that goes up Bridger Peak, 7 miles. It also goes to some reach 14 miles. Other branches go to Battle Canyon, etc. Tracks navigable.

On the way down (west again) we turned off three miles below the pass on the "road" that goes down into the valley. It was a mistake with this car, although apparently quite a few cars do go down. We barely made it back out. A pickup truck with standard transmission would have little trouble.

Station 89. Put by mistake on p. 55. e. of Lavery, Wyo.

Station 90. 4 mi. e. of Baggs, Wyo. on road to Lion. Lupine along road cut, in sagebrush. 1 egg + 1 hatched. 1 1st instar larva. 1 *Eledes*, 1 *Canadid*. Lupine sample.

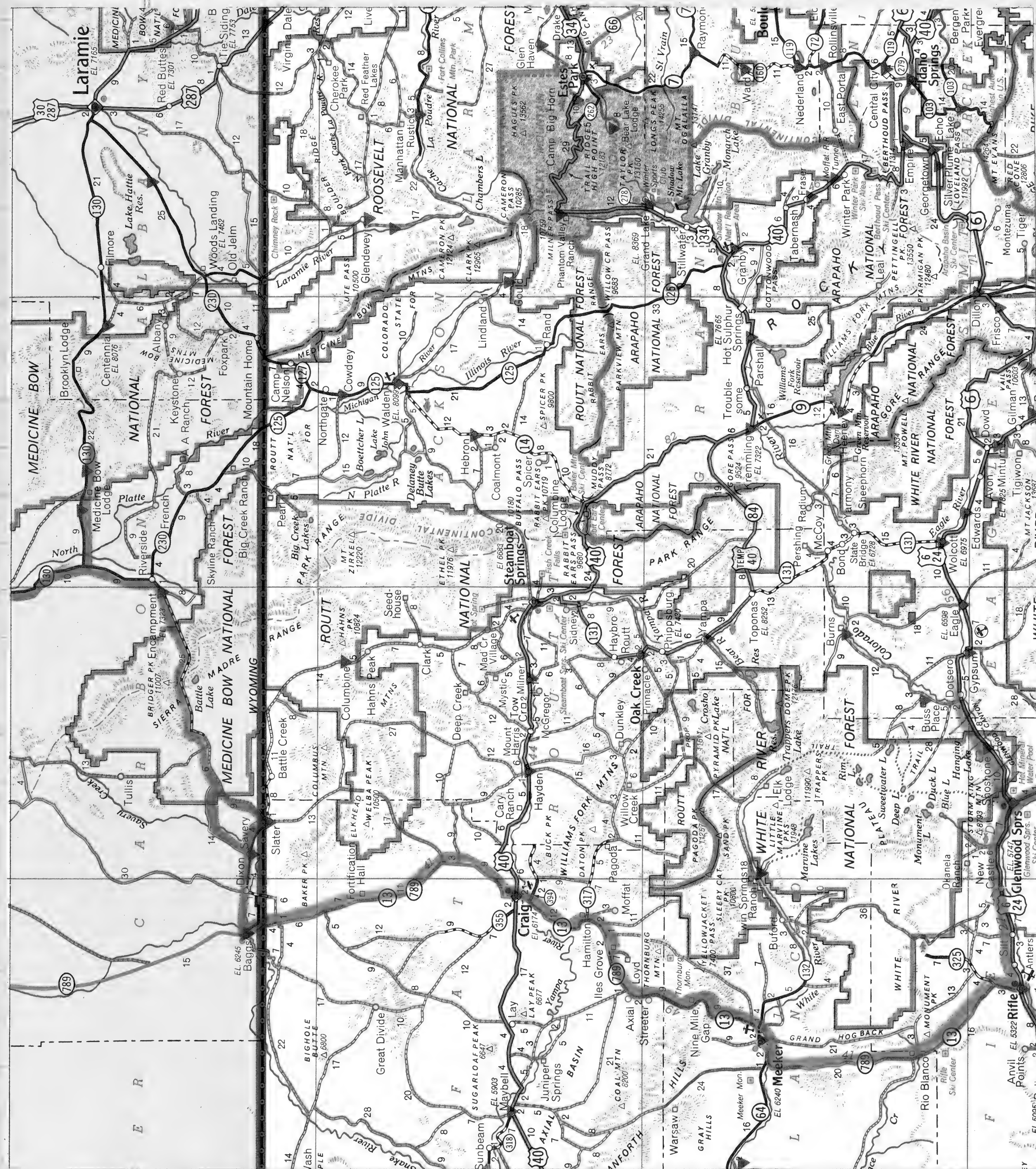
In Telfe, we stopped at the Ritz Rottage Kurst, and got a nice large cabin with twin double beds for \$6.00.

Station 91. Battle Lake, Wyo. Sierra Madre Mts.
Down in valley below the pass. (Belongs on p. 55)

We came through very interesting country today south of Craig, Colo. Mostly down narrow valleys between upended strata striking north-south. Everything covered with green vegetation, the hills with scrubby cedar and an occasional small patch of pines. The valleys mostly cultivated and amazingly well-watered. Several of the hills to the southwest had very even and straight ridges sloping down to the north. Looked like rift valleys but were probably erosion behind hogbacks. Took one photo just as the sun set, showing the ridges trimmed with sunlight and the rest dark.

Lupine occurred occasionally in isolated clumps over much of this route. It had rained in the mid-afternoon, so there was no use stopping for blues or even eggs.

John phoned Marion and got a report from Woodie: 1350 eggs received, 155 living larvae (hatched), 356 hatched on sand, 300 parasites emerged (115 from Harrison Pass), 70 lupines plucked.



July 11. Stopped at Arkendale, Colo. to see the Crystal River
 Mon. Rearing Unit (fish hatching). It consists of 10 parallel
^{greenways} (ditches) 500 feet long, six feet wide, 18 inches deep, and
 divided into 8 100-foot sections. No connection
 between the channels. Water from springs not reused.
 Fingerlings 3 or 4 inches long come from Rifle Hatching
 and spend about a year and reach 8 to 10 inches,
 averaging 7 to 8 to a pound. Four species present.
 But plant mostly rainbow trout, ^{each taken} native spawners,
 brook, alpine brook. 4 men & supervisors.

Water temperature about 52° year round. Open
 through winter by pumping from Crystal River.
 Planted 35 tons in 1959, 28-30 tons this year.
 Feed beef spleen, smaller ones beef liver once
 a week, other days prepared pellets.

Sorting bin with screen on bottom to sort
^{51x24} them by hand over the walls into adjacent
^{railways} ditches. If too heavy in one use sieve to
 transfer. Spawners from here is all taken to
 Glenwood Springs hatching unit.

Rifle Hatching, 16 men, 100+ tons of fish planted.
 Four times as large as this one. Set-up much
 the same as here. Photos taken.

"Better put it off till tomorrow, we've caught up enough today."

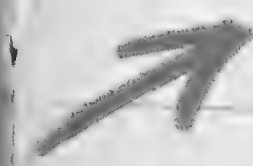
Station 92. 2 mi. n.e. of Aspen, Colo. Elev. 7625 feet.
 2 p.m. bright sun. Lupines sparse in heavy sage. Eggs
 and adult *icarioides* 6♀ + 10♂, *Lygdanura*, *L. heteranura*,
L. helioides. (2 alive) *Pieris protodice*, *Stenogramma*,
Satyria, *Zonitoides*, *Mordellids*, *Vespa*, *Megachilid*,
 yellow & black *Cerambycid*, 1 small *Staphylinid* fly wing.
 Lupine collected, also seeds.

The Aspen ski slopes are visible from here. One
 entire mountain slope has been cleared and stands
 stark in the summer.

Saw no lupine up the pass (to 12095 feet)
 or down to Twin Lakes Lodge, although the
 spruce replace the aspen. Scenery was fine,
 much glaciation, rocky peaks above timberline,
 roaring streams. At the lodge we stopped for
 coffee and asked the waitress if there was
 any of the blue flower called lupine around.
 She said there had been and we looked out
 the window behind the car and saw a
 dozen masses of it. None down the road
 for two miles. Only scattered small patches
 of it on the Leadville road.

All motels in Leadville were either full or
 had doubled their rates, so we went to the
 Vendome Hotel. Had little to mount, so we post-
 poned it and went to a movie.

So much topography has flashed before us and been replaced by more the next minute that it's been impossible to even to note most of it. Today several large snow slides where trees were down and piles of snow still survived because of the great mixture of mud, leaves, and rubble. Yesterday a long sloping ridge near Rio Blanco which exactly paralleled the edge of the plateau, - looked like a rift valley but probably was more of a hog back. The photo should show several parallel ridges in the background. Glaciated valleys with hanging side valleys and moraines especially in Battle Lake Valley in the Sierra Madre. Valleys cut off by a lateral moraine, which was later channeled by the side stream of a out of line with its original position. Mesas, buttes, hog backs, cliffs, formed by harder beds on top or tilted. The irregular erosion of soft material, often greenish or red, by water or solution on steep slopes. The badlands to southwest of the Big Horns and the red hogbacks southeast of them. Landslides of some years ago, where the scar was too steep for vegetation, which completely covers the irregular mound below.



Valleys formed along the strike of upended beds. Valleys or canyons cutting across the strike of upended beds, as the Wind River canyon between Shoshoni and Thermopolis, Wyo. Valleys between fault-block ranges, as Ruby Valley, Nev.

Mountains that were elevated fault blocks, like the Rockies. Hills that were old lava flows left high by erosion, ~~there~~ as in southern Idaho. Mountains of basalt left by erosion of the surrounding beds, as north of Casper, Wyo. Mountains formed by the broken and upended beds where the intrusion has collapsed or at least disappeared, as

~~mountains in central Wyoming~~. Mountains that have hogbacks only on one side or on both.

Tremendous talus slopes, and the small areas of less than an acre where the angular blocks average 18" on a side, such as passed on the road below Bridger Peak in the Sierra Madre and on the road above Aspen, Colorado. Sheep smooth slopes formed ~~by~~ along a bedding plane, as just south of Muddy Gap between the Ferns and the Green Mountains.

Wind erosion very difficult to distinguish from solution erosion. The bad lands may have some of this, although the source of sand was not evident.

Desert pavement was noted in the areas of badlands southeast of Ten Sleep, Wyoming. As we were generally looking for sagebrush country, we seldom stopped where the desert pavement would be seen. Sand dunes were not seen on a large scale.

A long valley through tan and greenish apparently unconsolidated materials was that of the Salmon River north of the Sawtooth Valley in Idaho. Surface lava flows such as in southern Idaho between Mountain Home and Ketchikan.

A rounded enfoliating "granitic" dome a quarter mile across and almost hemi-spherical called Independence Rock east of Casper. Many other sorts of outliers and erosion remnants. Teapot Rock near Teapot Dome, as a carved remnant. Jagged ridges apparently caused by cirques on both sides, as in the Sawtooth Mts., or by other erosion.

Narrow box canyons were seen in the southeastern Big Horns, above the red hogbacks. These were very steep. More normal ones occur in the lava bed country of Idaho. Rocky canyons (cliffs), talus canyons, flat-bottomed canyons.

July 12. Station 93, 2 mi. east of Leadville, Colo. (7th Street)
 Tues. In cloudy weather, found a few eggs on leaves and quite a few on buds. Also some flowers. Sun came out about 9:30 a.m. and immediately blues were flying. In less than an hour took at least 20 *icarioides* including five females, *melissa lygdamus*, *glendon*, *sapiolas*. *Parnassius sminthus*, *Boloria*, *Erebia*, *Oeneis*. About ten o'clock the clouds covered over again, and we called it enough. The lupine variable. One purple all over. Some white. Elevation 10,400 ft.

John broke the frame of his net, so well have to find a machine shop. (The third frame we have just isn't usable because the stiff net can't be removed.) The break was caused by the necessity of slamming the net down over specimens, as they had a way of escaping otherwise.

With mail for both of us came a telegram from Woody that he was running out of lupine to feed the newly hatched larvae. John agreed to airmail some, but on figuring times, it seemed likely that the parcel could be delivered before Thursday, and we could be home by Thursday ourselves without cutting the trip short particularly.

John picked up 15 1-gallon jars from the hotel kitchen, scoured up four plastic bugs and an ice chest, and figured we could get some lupine through in as good a condition as the airmail.

Left Leadville at 11 a.m. to go out through Colorado Springs. After we went over the first pass, began to watch for lupine, although it was raining most of the time. Found one spot in the South Platte Valley and filled five jars. From then on saw none at all. By ten miles up the canyon from Colorado Springs we were worried that we wouldn't find any more at all. Then in a road cut one bunch appeared, and it turned out to be a dozen bunches there and more along an old road. Filled the ice chest and two more jars. From then on saw none. Got 10 lbs. of cracked ice at Manitou.

Decided to follow H. 24 to U.S. 70.

We phoned J. Martin Brown from Manitou, but were told that he is in Durango and won't be back for a week.

At Limona I let John drive, as a special favor, with his driving that is responsible for the wobbly writing.

"Variation and evolution in *Platypharodon*. This is the title of John's project and NSF grant. This species was described in 1852 by Baird from one specimen from California. Since then 24 names have been applied to this species or to portions of it. Early work by Barnett & Edmunds and by Howard have straightened out some of the synonymy and are the basis for the 12 subspecies commonly retained. John's original interest (Master's thesis at Utah) was an attempt to verify the validity of the subspecies and to determine the chromosome of taxonomic importance. It included all available material, not very much. Distribution in western U.S.: west coast to 10,000 ft in Calif, Utah, Colorado, north to Skagway and Lake Louise, south to Arizona in Mexico. Mostly in Canada and transition zones. Morphological approach was further extended and used for *Phrynosoma* at lower. The genetic approach was limited ~~due~~ by lack of knowledge of breeding, habits, etc. The basic approach was a detailed comparison of structure, both in and between populations. Parameters of structural variation were plotted for over 100 different populations, though not the range of the species.

Both museum and field-collected material was included. One result of this analysis of the 100 populations, he had some idea of the range of variation. 10 of each of the characters studied - some 25 or so, and which were genetically and which environmentally influenced. Information on life history and ecology. Subsequent to the work to check these results, in laboratory, which is the current problem.

The present study is to include comparisons of populations from many parts of the range all taken the same year (first year) and comparison of newly collected populations from the sites of the original 100 populations. Also to study compare populations by rearing in the laboratory under identical conditions, the eggs collected in the field. Other data obtained includes host specificity, predation, onset and termination of larval diapause, and associations.

Platypharodon is one of 750 generic names in the Typhlopidae. Many others show the same range of variation. Some 300 of these belong in subfamily *Platypharodinae*. About 100 *Helicodonta* (sp. + subsp.).

All the "Lysini" are Lycaenidae, but not all the
Lycaenidae are Lysini. With the colla-
boration of Ehrlich and Ulrich, John is working
on a generic monograph of the Lycaenidae.

This year the problem of marking specimens in the field failed to work out, but several new areas were collected.

Kericho.	12131
Bus	12143
Sta. 49.	12134
Sta. 50. Kenya el. 8500 ft.	12174
<hr/>	
Lunch	12192
<hr/>	
Enallis, Sta.	12300 approx.
Station 53 —	12399 approx
Summit. —	413
Leahurst Road & 93 —	455.0
Sta 56	461.7
Stat. 57 — — —	463.9
$ \begin{array}{r} 12300 \\ 12131 \\ \hline 169 \end{array} $	

Missoula 12546
 Lolo 558
 Top of pass 592
 1 mi ^{n. of} ~~Lolo~~ Lolo 626
 Gas 12636
 Beaumont (62) 12678
 Bozeman 12865
 Bozeman - 12872
 Sta. 63. 12892 5,000'
 W. Yellowstone 12870
 Sta. 66. 968.8
 end 12971

12546
 12300
 246

100-7586

Station 94 5 mi. W. of the Pass, Colo., in the South
Platte Valley. On banks still soaking from
snow. Coldest spring in the room for we
are now in the mountains. Eggs were seen.

Station 85. 2 mi. w. of Cascade, Colo., just
west of Colorado Springs. Tuffines collected
from a recent lava flow.

Section 80. 2.5 mi. east of Colorado Springs,
Colo. on Highway US 24. *Lupinus* collected
by *W. S. S. S.* 8/10/1968.

VII-13-60 Station 97. Ellsworth, Kansas. 1 smooth black
Wad. Calosoma^(?) on sidewalk.

W. Yell.	12972
Turn off	12976
Sta. 67	12993
<hr/>	
W. Yell. Gas	13020
Sta. Ender.	13020 13091
Sta. 69.	13073
<hr/>	
Coulter Bay	13113
Sta. 70	128
<hr/>	
Gas Stop - Lodge -	13136
Topwater Pass	172
Sta. 71	175
Du Bois - North —	030
Sawmill	12.
Du Bois Smith	227

Jander	13308
Collecting site	13320
Lander - east	13331
Ruighton gas	357
Sta. 77	489
Ten Sleep City	483
down Ten Sleep	500.0
main road	506
76 (7775)	507
Pass	521
mont. lupine	535
Buffalo	560
	13565
	308
	<hr/> 257

Buff. 13567
 Sta 79 557
 Buff-south 611
 Mayoworth Road 642.0
 Top road above Mayoworth 659.6
 6850' 61.6
 22 switchbacks in 2 mi.

13887
 567
 320

Rawlins - east → 13 890

Eugene Elev.
 5200' to

Pictures Ferris Mt. at
 Whiskey Gap (East of here)

Saratoga turnoff 13 ~~913~~
 Saratoga 935 ~~945~~
 Sta. 955

Med. Bows, highest — 959.5
 130/230 13975

Riverside 13985
 Sta 67 - 8700' 994

Top of pass 14001.2

Baggs 14050
 Sta. 90 99
 142

Baggs So. → 48

Leadville 14437
 Sta 73 14441
 Leadville, out 14445
 Calc Sp. 3pm 14575
 Limon 658

14898

460

Wakeeney, Kansas 14900
 7-8 45
 8-9 45
 9-10 35
 10-11 55
 11-12 75
 12-1 8 (start 1:15) 63
 1-2 42 05
 2-3 45 152 50
 3-4 55
 4-5 45 350

Rifle 14288

Snowmass 14354
 Sta. 72 365

Pass 14390

Twin Lakes 14412

Intersection —
 So. of Leadville — 425

Aug. 27. Carbondale to St. Louis. Picked up 1960 Chevy (Turquoise)
 Sat. from Wash. Met 28 at Congress Hotel, drove over to
 Paul Blackwelder's for a few minutes, then out on
 US 40 intending to go a few miles. About 9 p.m.

Finally stopped in Higginsville, Mo. on rte. 16. 226 mi.
 Aug. 28. Ranges 13-24-21 to St. Joseph. Then 36 to Cherokee, Kans.
 Sun. Rte. 8 to North Platte and US 30 to Ogallala, Neb.

For the last 30 miles into North Platte we passed
 through country of grass covered hillsides, too dry
 for purple meadows; proved to be old sand dunes,
 Late Pleistocene which cover large areas of n. Nebraska.
 Took two photos (one I interfered with the shutter).
 The sun was very low and threw good shadows.

Some nice shallow erosion areas just south
 of this showing two stages of erosion. (No photo) 596 mi.

Aug. 29. US 26 Ogallala to Casper, Wyo., then US 87 to Buffalo, Wyo.
 Mon. with side trip to Mayoworth & beyond. (Met View Motel again) 465 mi.

Followed the North Platte River all morning but
 without seeing much of it. Saw bluffs in the distance,
 and crossed them near Scottsbluff. Rolling
 prairies to Casper, with one large oil field. Many
 of the ridges to south formed by tilted beds. Passed
 Teapot Rock and other erosion remnants. Photos.
 As we neared Kaycee, had good view of the Big Horn
 along southern section of the Big Horn. Turned
 off at Kaycee to Mayoworth and on dirt road
 through the hogbacks, same as July 8. Photos.

Aug. 30 From Buffalo via US 16 over southern end of Big Horn to
Tues. Bear Steep and Worland, ⁴⁵²⁰ to Greybull, Lody, & West Yellowstone

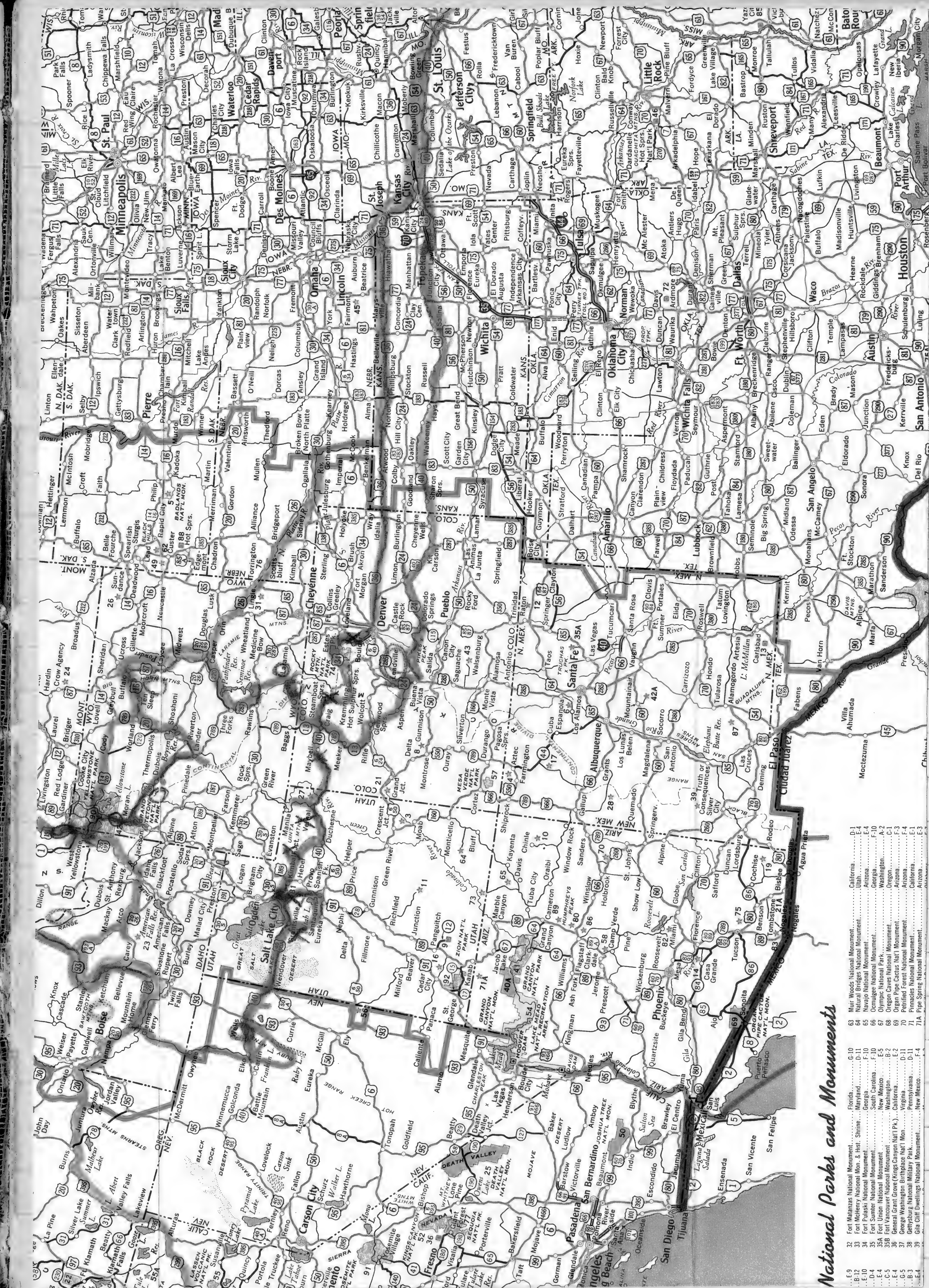
The main range is visible only as you start up the road, as one soon turns south through park areas where there are no views. This is mostly stream and mud flow gravel, fair outcrops. Only at the top of the pass, 9666 ft. do the pre-Cambrian gneisses crop out in large jointed masses. The gravels were probably derived from glacial gravel above. In the Bear Steep Canyon, there are high cliffs of massive Mississippian limestone (dolomite), dirt, sandstone, shales, interbedded. The only glaciation was in the upper Bear Steep valley, running south, with the head probably where the canyon starts - to west.

Just west of Ten Sleep, across the red valley from the mouth of the canyon, a bright red cliff with early horizontal beds, Triassic (Anquader), gives way very suddenly (horizontally) to the variegated gray granite Morrison (upper Jurassic). West lies sharp fault on one side, followed by a sharp valley. This is first to the left of right of the road. Morrison on left. Farther to the left there is a consistent but showing occasionally in the cliffs, forming the ledge with the irregular caves beneath. Much of these ledges.

The Morrison gives way to Cretaceous and then to Eocene. All gently dipping west, all fine-grained shales. No gravel or desert pavement. Evidently very dry but enough plants to keep wind erosion down. Oil wells scattered all over this area, some new, some pumping.

In the afternoon we turned west toward Lody, climbed out of the river bottom onto the whitish or variegated Cretaceous or Eocene shales. This continued with some bluffs for 100 miles. At Lody we saw Heart Mountain 10 mi. to north. It stands alone, almost a bubble on top, an erosion remnant, but actually of complicated structure - the Heart Mountain Overthrust. The Paleozoic rocks on top of the Cretaceous/Tertiary, moved laterally several miles (eastward) and then eroded.

Just west of Cody we entered the Shoshone Canyon. It passes through many miles of mountain ranges forming a large area rather than a single range (Absarokas). The canyon is lined with cliffs and talus slopes, mostly in Eocene volcanic breccia. Many elaborate pinnacles, with recognizable shapes. Occasionally a 4-foot dike crosses at right angles to the road, making a sharp outcrop up the sides of the canyon. These pyroclastic range from fine ash to large fragments of rock, worked after the explosion emission by mud-flows, etc. into alluvial fans. These sometimes show stratification, and sometimes folding, but very prominent vertical jointing. The joint blocks are caused by shrinking especially with bursting. Numerous side canyons seem to show similar conditions over a wide area. It was interesting in seeing evidence of glaciation inside Yellowstone Park. We saw not one single definite piece of evidence. There was supposed to have a glacial cap over the whole plateau, perhaps built up from neighboring ranges. If so, EB thinks it must have been old - probably second epoch (the earliest one recognized in the Rockies).



The fourth epoch (Wisconsin) would be seen in unmodified moraines, usually very evident. The third epoch might appear in moraines or in road cuts, but only "possible" examples of this were seen.

We stopped briefly in the geyser basins.

Aug. 31. To Hayden Reservoir + Montana-Yellowstone Earthquake Area. Saw what is visible from the north end, including the fault scarps, the Hayden Dam damage, the road break, the new lake covering the road but 50 feet lower than the original level (because of a cut in the landslide made by the Forest Service). The top sheets I brought along were not very illuminating. We decided not to go around to see the landslide from the southwest.

My cousin Justin Hill was camping in the area at the time of the earthquake. They were so loaded that they got out without assistance or difficulty.

Back to West Yellowstone and out to Idaho Falls by US 20. Same route west to Arco and then southwest to Craters of the Moon National Monument. This is a well arranged exhibit of 75 square miles of lava flows, ash cones, craters, spatter cones, cinder cones, etc. Exceedingly rugged, but with good roads and trails. A fantastic place. Photos.

Just north of the Monument is an east-west line of hills/mountains with a young pattern of valleys but few gulleys. The entire surface, not very abrupt anyway, was singularly smoothed. It is judged that sand from the plains had blown onto these hillsides and liberally buried the gulleys. I took two photos.

Also on the edge of the Monument I took photos of a small pressure ridge on top of the sheet lava, which split open radially upon cooling. Also a view of the very cliffy mountain face northwest of Arco, ~~was~~ formed by alternating hard and soft beds of limestone (Paleozoic?).

Coming west from Idaho Falls we passed Twin Buttes, one obviously a volcanic cone, the other presumably also one but not looking like it. Also a much larger mass called Big Butte, which also shows evidence of one or several craters.

Rte. 20 from W. Yellowstone to Idaho Falls, to Arco, and the Craters of the Moon. Then back to Arco.

Sep. 1. From Arco north on ~~the~~ 93^{ALT} to Challis, then southwest
Thurs. on 93 along the Salmon River to Sawtooth Valley
& Shoshone, then ~~the~~ 20 to Boise and on to Caldwell, Ida.

Northeast of Arco along the Lost River range, which is rugged, with ~~the~~ high outcrops of nearly vertically tilted beds - probably early Paleozoic. Along the face there were triangular facets at the end of ridges between gullies, apparently along a fault line. Farther south the outcrops were ~~more~~ mostly high up on the mountains and the lower slopes were smooth slopes and rounded surfaces, very steep for alluvium and probably sweeping. In many places an "eyebrow" line across the base of the range seemed also to show a fault line.

These foothills and come out in the valley farther north are devoid of any but very small and inconspicuous vegetation. They are somewhat irregular in arrangement and smooth all over. One large pair of alluvial fans showed overlapping due to higher level of one. This ~~one~~ seemed to head up into a cirque, possibly with a terminal moraine high up, right at the outlet of the cirque. There seem to be old cirques on many of the peaks, but not very definite ones.

The Salmon River Canyon above Challis is similar to the lower part, very evenly V-shaped but winding - the curves evidently determined by features older than the river. Most slopes are talus, sometimes with less vegetation. Often there were narrow channels called rubble stripes that seem to be shallow gullies later ~~than~~ filled with the rubble. Sometimes little mud flows have come down on top of the rubble.

In the Sawtooth Valley we saw the long moraines on the west side and apparently at least one from the east. One of the west apparently crossed the valley and may have dammed it temporarily.

Sep. 2. From Caldwell, Ida. on ~~the~~ 20 to Burns and then
Fri. south to Alturas on US 395.

Following the Malheur River, after a few miles of monotonous country, began to see many of what I call rubble stripes, narrow and shallow lines of angular talus that fill a small gully, probably made in a single storm. They are frequently all over a hillside but always follow the straight line ~~line~~ caused by gravity. They are usually on steep slopes but sometimes on gentle slopes. Photo. There must be a source of the angular rubble, usually a lava outcrop.

A few miles north of Lakeview we came on a small playa ^{Bullhorn Lake} (photo) and then noticed that the valley had very clear lake benches all around, probably nearly 200 feet high. At the south end these certainly topped the ridge around the end, and there was another playa in that valley.

The south end of this second valley also seemed to be low enough to overflow but we found no evidence that it had. Right on this divide there was a fine example of a fault block slipping off the cliff onto the valley floor. The cliff is 2500 feet high, very abrupt, and we later on saw many slips. On this one the top surface was preserved although broken into several blocks. Photo.

All day we were in old (Miocene) lava country, occasionally seeing soft light colored beds of volcanic ash.

We thought we saw water flowing out of Goose Lake on the California/Oregon border, but it is supposed to be landlocked since 1869^(?). The stream certainly flowed away to the south - may have been ^{spring} fed.

June/July 1962

June 24. Mileage 53919. Left Cardandale with John Lawney at
Sun. 9:30 a.m. in a University Mercury (3-104, Ill. lic. U-4296)
bound for western Nebraska & South Dakota (+ perhaps
farther west and south) to visit the easternmost
localities of *Plebejus icaroides*. Took rte. 40 from
St. Louis, 71 from Kansas City, and 36 from St. Joseph.
Stopped first night at Belleville, Kansas. ⁵⁸⁹~~587~~ mi.

There were so many insects around the motel
lights (Bel Vista Motel) that we couldn't resist them.
Took enough to fill a Schmidt box. No cerambycids.

Last night about dusk we kept thinking we saw
lupines along the road. Probably only alfalfa or clover.

June 25. Mileage 54508. Turned north on US 81 to York, Nebraska.

Mon. Sta. 102. 10:15 a.m. 5 mi. n. of Belleville, Kane. 2150' elev.
Collected on roadside in large thistle patch (much of
thistle past flowering stage. Just prior to rainstorm.
Not many things flying. Teps fly short distance & then
settle down. Collected: 1 ♀ *Euclyptus comyntes*, Ichneumonidae
(common, several species), *Polyblastus*, milk-weed ceram-
bycids (*Tetrasopos*), weevils in copula, several large
green chrysomelids. Noted absence of *Epicauda* & *Nemog-
nathus* on thistle.

Another heavy rainstorm during lunch in York.
From there to Grand Isle, much thin smoke from rear;
proved to be transmission fluid.

There had been storm warnings over this part of
Kansas and Nebraska yesterday and today. (Tornadoes)

at Halsey (54775) there is a section of Nebraska Nat.
Forest (Berkey Riv.), a pine-covered ridge among the
sand hills. Also a nursery.

Stopped for the night at Alliance, McCarroll's Motel.
Very roomy and quiet. Met a party of seven USDA men from U. of
Nebraska on a soil erosion project. One elderly man named
Weakly had studied lupines in this area as possible cattle
poisons, so he knew a lot about their distribution up
into the Black Hills. Gave us many pointers. (The poison
was selenium from the soil - lupine not particularly
bad as an accumulator.)

June 26. Mileage 54919. Time change. Left town about 7:45 a.m.

Tues. Sta. 103. Highway near Hemmingford (Neb. rte. 2). 1 large
red-striped *Eledorus*.

No callot at Hill Top Motel in Crawford.

West thru Moline Canyon on US 20. No lupine
until on barren hilltop about halfway to Harrison.

Sta. 104. 13 mi. e. of Harrison, Neb. on U.S. 20. Small
lupines along road with eggs & 1 1st instar larva. No
adults flying. Ants tending aphids. Took lupine
samples, also another plant with same habitus but only
3 to 5 very broad leaflets. Windy; humidity 60; temp. 24°.
elevation 4900'. [Few minutes later, same place, several adults.]

Drove north from Harrison into "canyon country,"
pine-filled valleys, not very steep, opening out at
both ends in eroded badlands or sandy hills.

Sta. 105. Monroe Canyon, 6 mi. n. of Harrison, Neb. 4900' ±.
Lupine but only *Phacodes piceus*; skipper, *Speyeria*,
red clerids, a bumblebee, buprestids, flies, etc. Windy.

Sta. 106. Sawbelly Canyon, 5-10 mi. ne. of Harrison, Neb.
Hedge of lupine but until the last moment no blues.
Hot lupine samples. Bumblebees, gray & blue damselflies.
Elev. 4875'. Humidity 77. Temperature 26.5°.

1. Hydrophilid, flies (small muscids), ichneumonid, pompilid.

Sta. 107.

Many large cyclophorini or calocorinas running on road.
Also about 4 *Memphotha* on nonflowers.

Stopped in Hot Springs, S.D. for the night.

Sta. 108. Hot Springs, S.D. A small salpugid
running rapidly on floor of motel room.

June 27. Mileage 55109. Car not running very well and
Wed. exhaust noisy, so we pulled into a Mercury
garage. Exhaust gasket & automatic choke.

Drove to Custer. Stopped at Forest Service Office,
and were told of a limestone area to n.w. No lupines
evident in the surrounding granite areas. 3 mi. n.
of town turned west on road to Moon. Mileage 55147.

Sta. 109. 14 mi. n.w. of Custer, N.D., on road to Moon. Large
buprestids, small cerambycid, small buprestids, 4 species
of lycanids, etc. *Pieris lycaon*. [added to Sta. 110.]

Sta. 110. 20 mi. n.w. of Custer, N.D., on road to Moon. Lupines
& several lycanids, but no *icarioides*. Temp. 22.5° C.,
humidity 60. Mileage 55167. *Pieris* & *Parnassius*.

The blues included: *Calliphrys eryphon*, *Glaucopsyche lygdamus*,
Eversmannia, *Plebejus saepiolus*, & *Agriades glandon*.

A ^{half} mile farther on found a large hairy lupine.
Elevation 7000. Two species growing & flowering side by
side. One has larger blooms taking longer to
mature but seem to start blooming later.

Add *Colias*: *alacran*, *Physodes*, 4 *Glaucopsyche*. (line?)
Agriades glandon.

Sta. 111. About 7 mi. n. of Moon, S.D. A large bank of
large hairy lupines. 1 ♀ 1 ♂ *P. icarioides*, many
green *Lytha*. Counted 100 stalks - 1 egg!

Went through mining town of Lead, jammed be-
tween walls of canyon - large open cut mine -
no lupines - to John's Motel in Deadwood, S.D.

Very few insects flying at night, altho warm.

Sta. 112. Deadwood, S.D. At light, 1 Cerambycid,

June 28. Sta. 113. 5 mi. w. of Lead, S.D., a few glabrous lupines.
Thurs. Several blues & other butterflies.

Mileage 55225.

Sta. 114. Spearfish Canyon, 2 mi. n. of Spearfish, S.D. Elev.
4800. Glabrous lupine in seed. Massive limestone.
Chafers, 1 new blue (*Pseudargyria*), gray ceram-
bycids, coccinellids, small buprestid, misc. butterflies.

Deadwood & Lead were in slate or colored
rocks, not limestone. Latter appeared about
5-10 miles to west of Lead.

At Sta. 114 John saw a swallowtail that seemed to be a hybrid between *Papilio eurymedon* and *P. rutulus*. P.e. has whitest wings. P.r. has three tails. This specimen had white forewings only, and three tails. Specimen got away.

From Spearfish, S.D. took U.S. 14 to Sundance, Wyo. Alfalfa lush all the way. Also in the red beds all the way.

(on road to red bed towers)
Sta. 115. 5 mi. n. of Sundance, Wyo. 6250 ft. Pine forest. Many lupines in isolated patches. *Plamopsycha lygdanum* and other butterflies, gray cerambycids, Spingid that mimics bumblebee. Also in Renter Canyon 350' lower. Many *Lygdanum*, 1 *icarioides*.

Sta. 116. Hills about 1 mi. n. of Sundance, Wyo. 5075' elev. Dense lupines on exposed hillside. A few *icarioides*, many *Lytha*, 3 *Rhynchites*, *curculionids*, 3 cicadas.

Kept west + north to Devil's Tower. Then north + east back into South Dakota. The tower is very impressive.

Sta. 117. 5 mi. e. of Hulett, Wyo. Along road in red beds. Very large lupine. No blues. A reduviid, several striped cerambycids, a chafer, an elater, a hesperiid (Rack), 1 *Pieris heguerti*. Elev. 3950'.

1/4 mi. farther east, at least 15 *icarioides* and 1 egg.
1 *Eucera*, 2 *Asilids*, 5 ♀ (2 alive) 1007
1 black and red cerambycid. Temp. 27.5° Humidity 58%

Arrived at Belle Fourche about supper time, but found both of the motels full. Found another.
Sta. 118. Belle Fourche, So. Dak. Flying to lights. 3 ♂ *Prionus*, 2 *Phyllophaga*, 1 *Coprinae*, 4 spp. *Carabidae*, a water boatman, 1 reduviid, 1 carpenter ant, 1 *Zion*.

Up to 2 nights earlier, the motel had had its furnace on at night. Earlier in the day a bartender reported that this had been the coldest and wettest spring at Hulett, Wyo., during his lifetime. 22 inches rain since April. Aver. ann. precip. is about 12 inches.

June 29. Headed north on U.S. 85. Mileage 55396.

Fri. Sta. 119. North Cave Hills, west of Ludlow, S.D. 2850' elev. Temp. 27.5° C. Humidity 38.5%. Many lupines starting halfway up valley, heading north. Many *P. icarioides*, ant in association with living larvae, eggs. At least 2 spp. of ants. A living ♀ *icarioides*, 1 cicada, 1 ant-like bug, 3 bumblebees, 1 green *Lytha*.

This was about 2 mi. s. of Valley Pass. The surrounding cliffs are yellow-brown sandstone. Just north of the hills came back into white + red beds, more dusty, rolling country, no lupines.

Lunch in Bowman, N.D.

Green aphids at base of stalks where the ants were with the larvae.

Sta. 120. 23 mi. n. of Bowman. 1 *P. melinae*. Very dry, almost nothing flying.

Could find no lupine along US 85 to Belfield on US 10. Got the last room in a motel (5:30 p.m.), had supper in town, and then drove out west 12 miles to Badlands. Very impressive but ^{almost} completely covered with vegetation, except on cliffs. Main loop road closed for repairs but 5 mile side road open to Burning Coal Vein, lignite beds burning under the clay, converting it to a brick-like slag or scoria. Very interesting area of cave-ins over the burned-out layers, the drop being fairly even over at least an acre. The remains of the old walk could be seen for 25 yards out from the present edge, having dropped down in fragments at least 4 feet. A trail goes around to the right to the rear of the area. We continued around the circle by climbing over the cracking clay but were forced by hot spots to climb to the top of the north cliff. Saw a mule deer from there. A herd of 15 buffalo blocked the road at one point. Prairie dogs live in a burrow near the entrance, showing no fear of the cars.

June 30, Mileage 55668. Scattered showers last night.

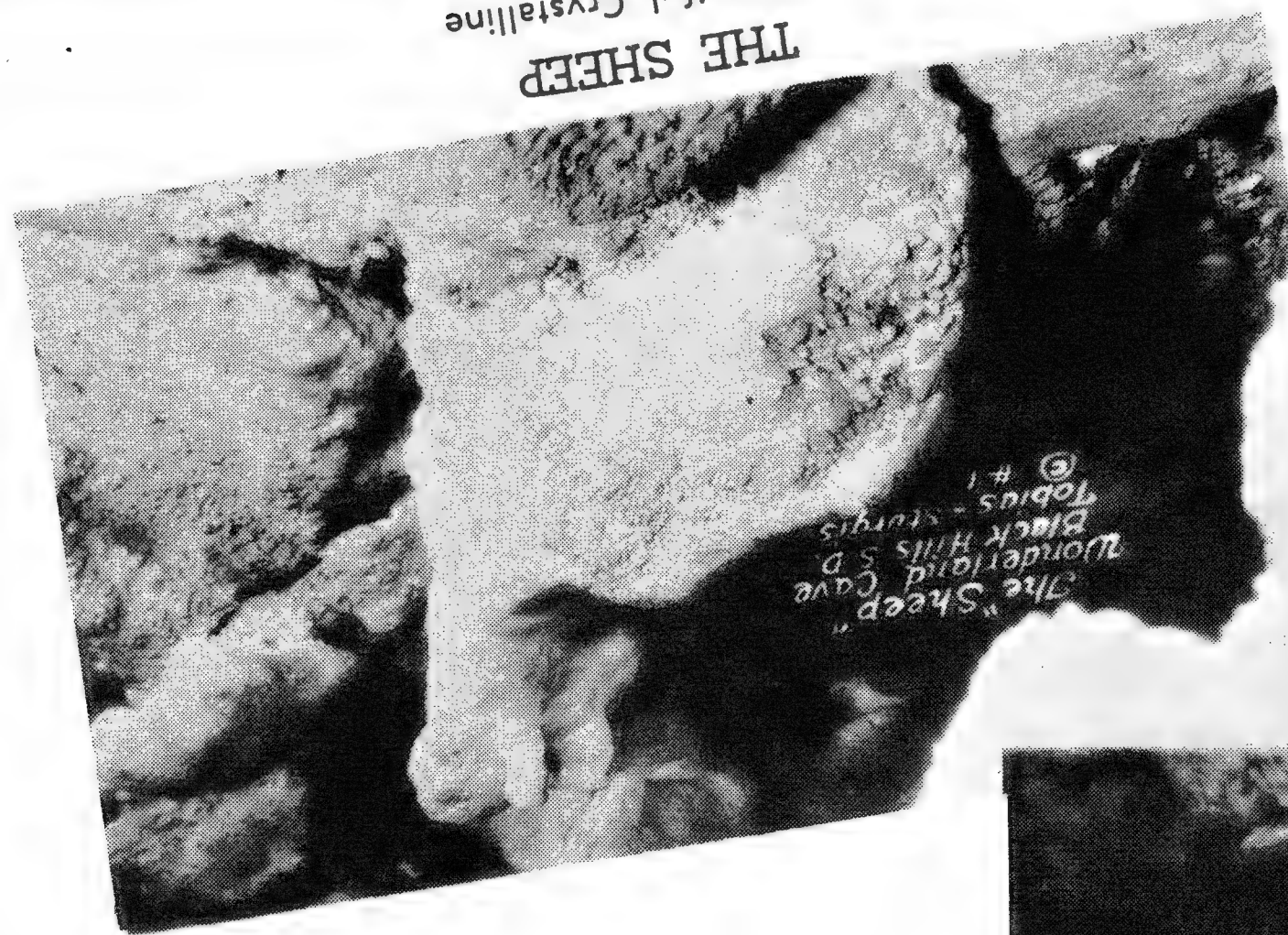
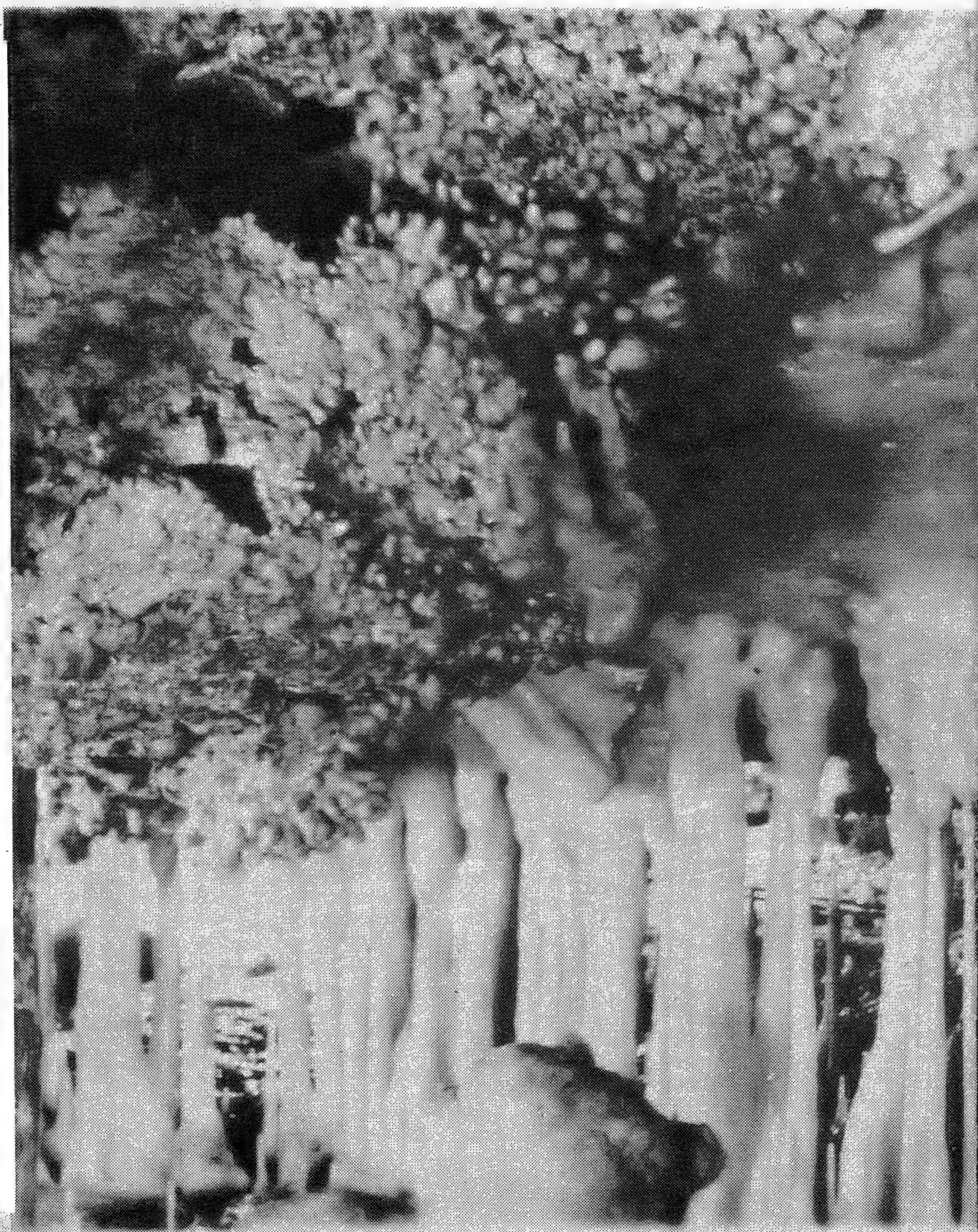
Sat. In Zies. Roosevelt Nat. Mem. Park we drove 5 mi. n. to the Cottonwood Campground along the Little Missouri River. The ranger told us that the entire area was sprayed with DDT two days ago because the local mosquitoes carry western equine encephalitis. There were plenty of insects flying.

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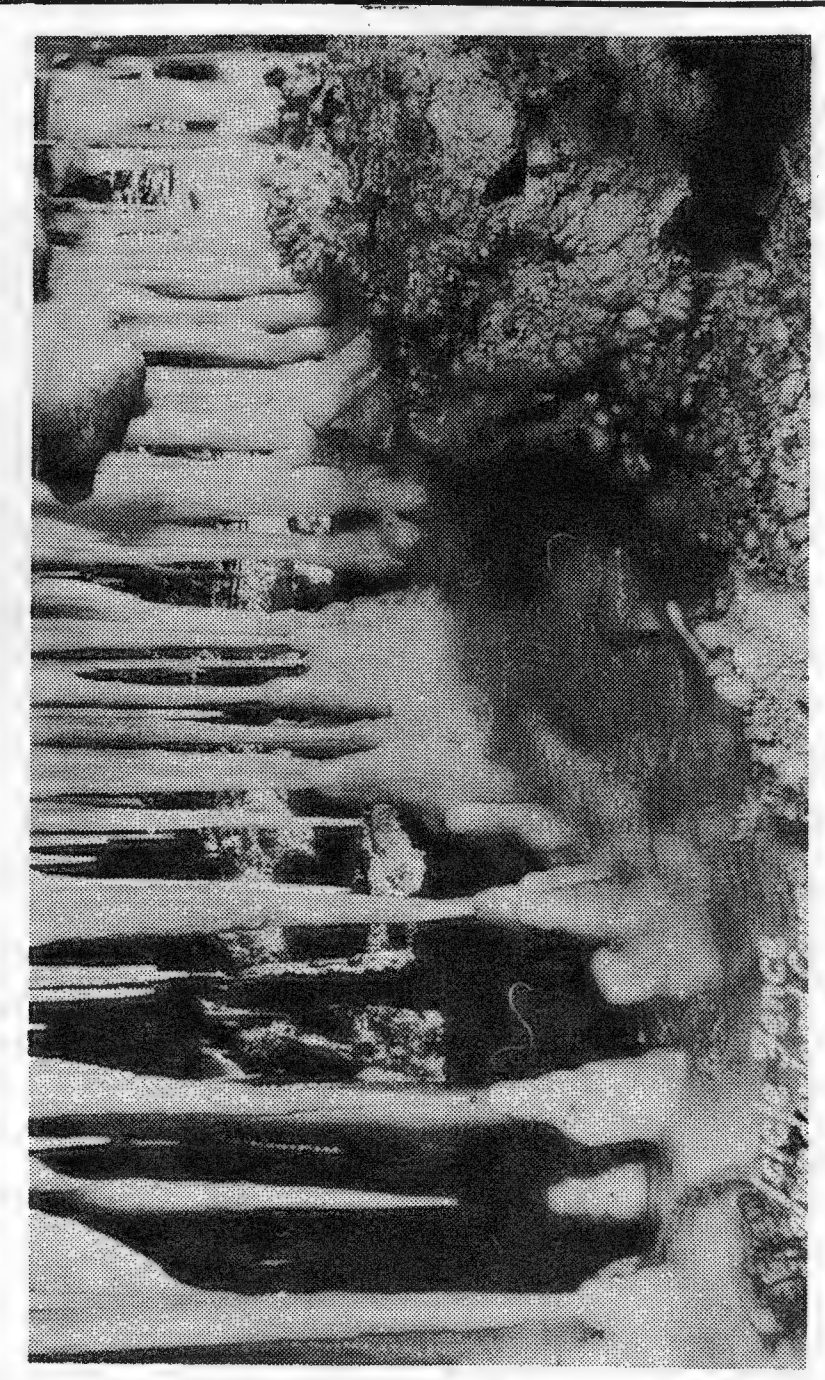
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MANAGEMENT PROPERTY

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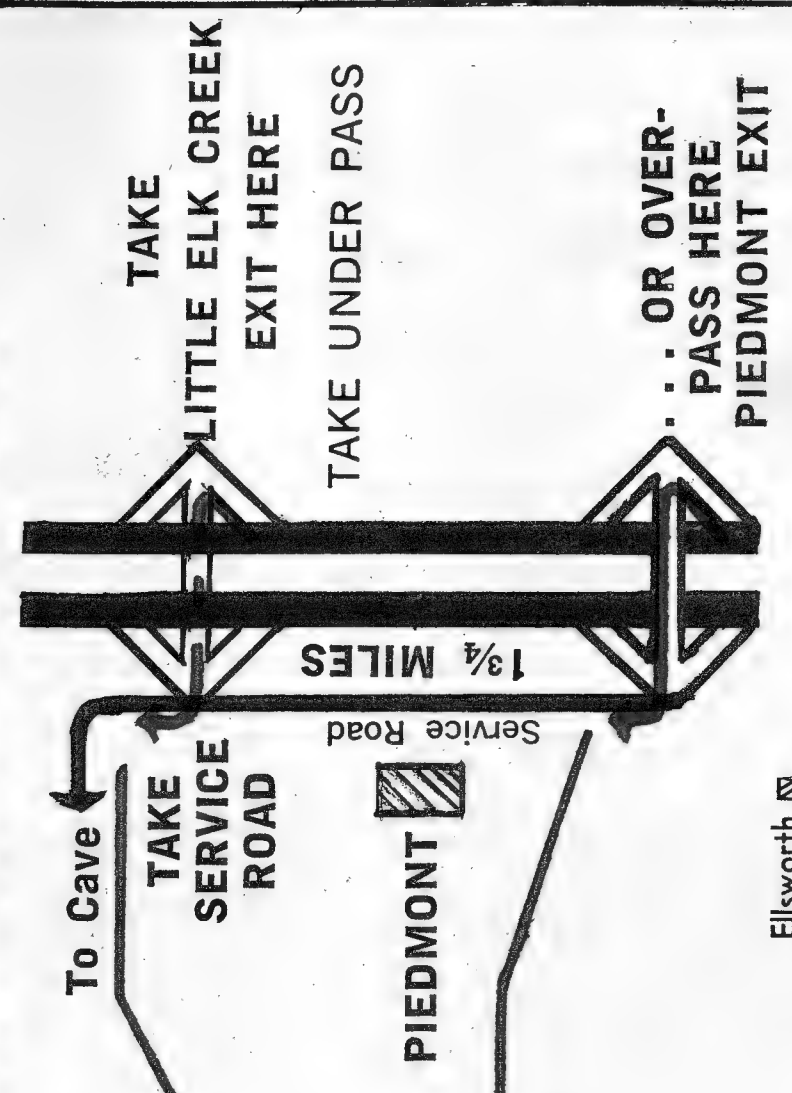
A Beautiful Crystalline
Resembling

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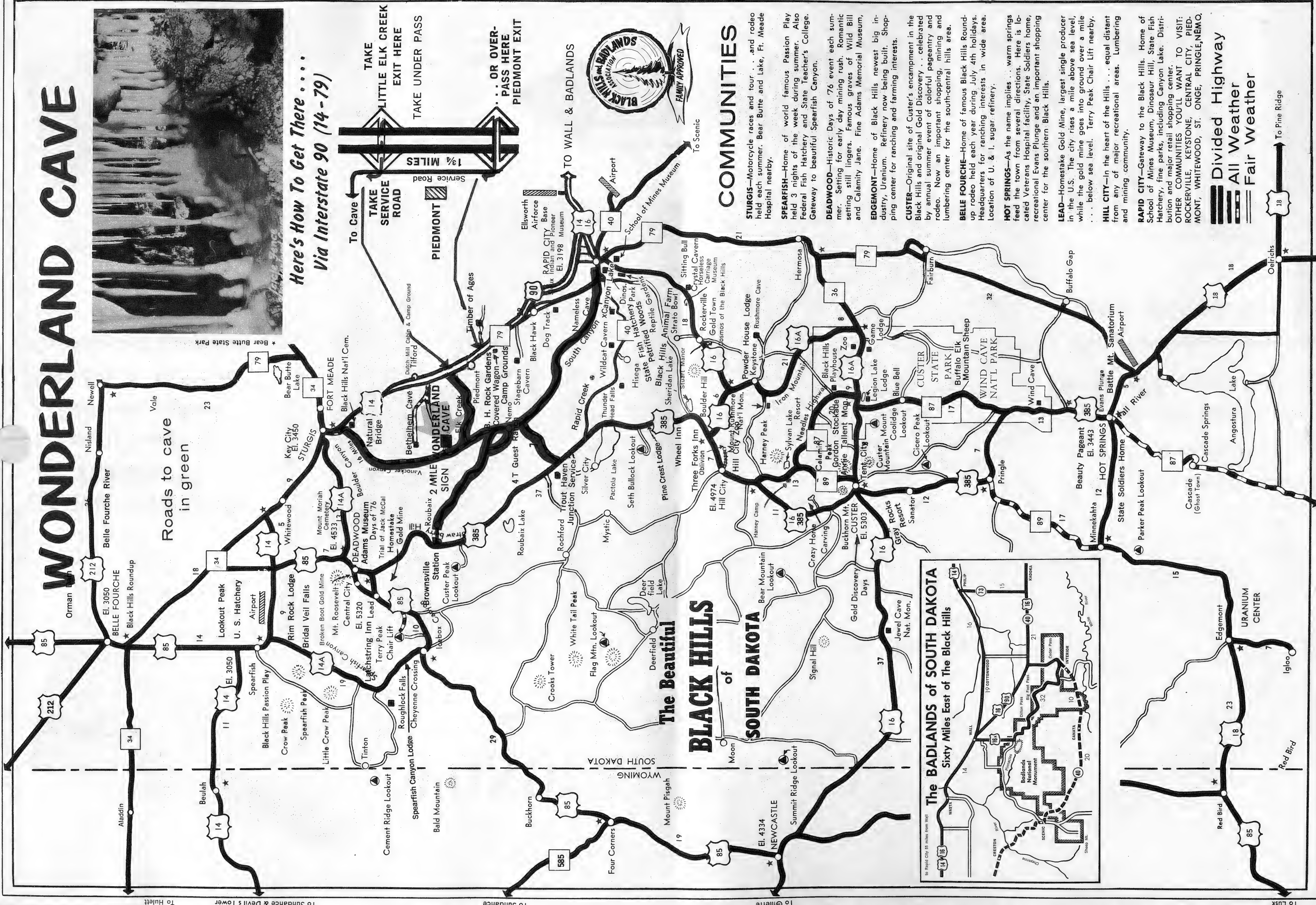
WONDERLAND CAVE



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Via Interstate 90 (14-79)



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COMMUNITIES

STURGIS—Motorcycle races and tour . . . and rodeo held each summer. Bear Butte and Lake, Ft. Meade Hospital nearby.

SPEARFISH—Home of world famous Passion Play held 3 nights of the week during summer. Also Federal Fish Hatchery and State Teacher's College. Gateway to beautiful Spearfish Canyon.

DEADWOOD—Historic Days of '76 event each summer. Setting for early day mining rush. Romantic setting still lingers. Famous graves of Wild Bill and Calamity Jane. Fine Adams Memorial Museum.

EDGEMONT—Home of Black Hills newest big industry, Uranium. Refinery now being built. Shopping center for ranching and farming interests.

CUSTER—Original site of Custer's encampment in the Black Hills and original Gold Discovery . . . celebrated by annual summer event of colorful pageantry and rodeo. Now an important shopping, mining and lumbering center for the south-central hills area.

BELLE FOURCHE—Home of famous Black Hills Round-up rodeo held each year during July 4th holidays. Headquarters for ranching interests in wide area. Location of U. & I. sugar refinery.

HOT SPRINGS—As the name implies . . . warm springs feed the town from several directions. Here is located Veterans Hospital facility, State Soldiers home, recreational Evans Plunge and an important shopping center for the southern Black Hills.

LEAD—Homestake Gold Mine, largest single producer in the U.S. The city rises a mile above sea level, while the gold

Sta. 121. 5 mi. n. of Medora, N.D. at Cottonwood Campground in Theo. Roosevelt Nat. Mem. Park. 1 Cicadellid, 1 Arctiid, 1 field cricket. One small patch of lupine near the river bank. Few leaflets, glabrous, small, non-bushy, heavily in seed. Samples by permission of ranger. The soil is very sandy (fine dark gray sand). Above normal flood level.

Sta. 122. Elev. 3700, on top of Sentinel Butte. Many wild flowers, no lupine, but something very much like it on slopes (very hairy - fine leaflets). 2 cerambycids. Down off the peak, a few *Typha* + *Episcia* gray.

Southeast on US 312 (also on 212) toward Broadus.

Sta. 123. 3 mi. S.W. of Stacey, Powder River Co., Montana, about 1 mi. into Custer National Forest. Lupine suddenly abundant along road and up among tall grasses. 16 icarioides. 2 robber flies, 2 bees, *Episcia*, coccinellid, flea beetle, red bug. 3800 ft. elev. Edge of pines. 1 larva with very small ants.

Sta. 124. Broadus, Montana. On Mont. Rte. 8, US 212, US 213.

1 *Polyphyllo* and 1 coccinellid at lights.

July 1. Mileage 55985.

Sun.

While John is at work, I'll note a few observations about *P. icarioides*. I seldom seem to flush it out by disturbing the lupine. Instead, when I stand still a few minutes, one is likely to fly up. When one flies, often a second will fly up.

and the two will flit about for a few seconds. Sometimes another species of butterfly or moth will prompt this sudden brief flight. If a specimen is chased very far, it will suddenly disappear, apparently dropped to the ground. In a few cases I've found it, just resting with the wings folded. At such times it can be picked up on the fingers but doesn't take flight readily.

The lupines that I've seen lately have been very local in distribution. Perhaps very abundant but disappearing in a mile or so. There sometimes is no apparent change in the environment.

Most of the accompanying plants - "indicators" - are more widely ranging.

The most profuse carpet of wildflowers I've seen anywhere was on the wind-swept top of Sentinel Butte. The variety and number of very low flowers was extreme.

Our theme song has been "Ida, Sweet as Apple Cider," but now we also recognize as our patron saint, St. Ida of the Lupines.

Sta. 125.

Came upon these lupines very suddenly, on a back road west from Mont. H. 319, to Recluse + US 14/16. There were pines on the hills but none at this point. The lupines ~~disappeared~~ continued to Rte. US 14/16 and then died out. None near Gillette, Moorcroft, Upton, Newcastle.

On U.S. 85 at mileage 56250 John saw a lupine while driving. In the butte hills like Peapack dome, about ⁸ mi. n. of Lusk, Wyo. Niobrara Co.

Sta. 126. 8 mi. n. of Lusk, Wyo., on U.S. 85. Roadside at nearby small butte. A dozen eggs (lost have of them), a couple of adults, on sparse lupine. Many plants very small and without flowers. Eggs on basal leaves of large flowering stalks.

Supper at Lusk and on down U.S. 85. Lupines disappeared soon. Saw none in Goshute Co. until almost to Jay Em. Then saw a large field in the distance and tramped over to it. Took one *icia* *rioides* on the way. Jumped a creek and found the blue field to be small thistles. Where the blue was flying John found 7 clumps of lupine.

Sta. 127. 2 mi. n. of Jay Em, Wyo. 7 p.m. Elev. 4750'. 1 ♂ *icia* *rioides* in dense pasture. Also *Lycaena* sp. (?). 2 *Satanids*, 1 damselfly. 3 eggs

Nodules - west of Biddle, Montana, nr. Wyo. line.

July 2. Mileage . Gering, Neb.
Mon.

July 3 Mileage . Seneca, Kans. on H. 36.
Tues.

Last night we spent an hour discussing possible improvements in Zool. 102. It might be possible in the Crustacea, for example, after studying crayfish as before, to see and/or dissect isopod, isopod, barnacle, and *Limulus* in one lab, comparing back to crayfish. Make the students' notebook of importance to them in these comparisons. The same thing could be done for insects, mollusks, echinoderms, coelenterates, and possibly Protozoa.

1967

June 15. 12688 mi. 12 noon. John Lowrey, Don Lawrence, Dick B.

Mon. Univ. car 3-132, '64 Ford. St. Louis - K.C. - Topeka.

Stopped at Meadowlark Motel.

June 16. 13123 mi. We got there! Colorado Springs about 6 p.m. HOT

Tues. Stopped at Tourist Motel - \$10.00 for 3. Supper at Western Pancake

shop good. First two strings of bowling. A tie! Phoned

7 M. Dawson at Fairview Valley School. Can't see us tonight

nor until 10:30 tomorrow. He's teaching in summer

school at Colorado College. We have decided not to

wait that late. John May see him on return.

June 17. 13703 mi. On our way at 7:30 after pancakes as above.

Wed. Stopped in Manitou for lamp shades - glass - for searing.

Sta. 201. Mil. 13765. Wilkerson Pass on US 24 west of Manitou.

Elev. 9525. *Quercus*, *aspid.*, *gray* *Epirantha*. Windy & cool.

US 24 to US 285 to US 50 at Poncha Sprs. Lunch at Sharano Inn.

Gasoline at Sargents. 1 mi. e. Doyleville, Colo.

Sta. 202. Mil. 13872. (12 mi. w. Sargents, Colo. or 20 mi. west

of Gunnison) First lupines seen - many glabrous ones

in full bloom. *Veronica* one rare and in seed, but not

alongside road. Pressed both lupines. Elev. 8300 ft.

1 *Philadelphus* ♂, 2 ♀, *Epirantha* on glabrous lupine, *aspid.*,

hugs. Gunnison Co. In sage brush.

June 18. ± 13940 mi. To Crested Butte & on up to _____, where

is the Rocky Mountain Biological Laboratory. The director

is Robert K. Enders. They have a couple of dozen log

buildings and good field lab facilities. 9500 ft.

We drove back down to the ski area for the night,

to Crested Butte Lodge. Don and I climbed about

12 maybe
P. aurea

1000 feet, nearly half a mile, up the ski slope, under the gondola lift. The lodge is run by Kent Bathright and his wife & two small children. A very fancy place and comfortable. We pay \$5 each for room with beds + breakfast, and \$3 with lunch.

June 18 ± 13940 mi. Drove up to Dub; the snow + rain of last night had melted, except on upper slopes. This area has many large landslides, leaving many valley areas hummocked. All around, the 14,000 peaks are glaciated + all the valleys. From high up, the cirques are very clear.

Sta. 203. 2 mi. east of Highway 135 in Cement Creek Canyon, at Am. Cr. Guard Sta. Sagebrush side gulley had many lupine; only a few in bloom. *50 mi.* *Eristhenia argyrea*, *P. fairmanii*, *Aquilegia glandon*, *Er. comyniana*, many ♂; other lps. *Erythraea* on wet iris + lupine, *Quercus*, *Colinus*, skipper-blue. Clerid, bichromid flies. Several sawfly spp., Ichneumonid wasps, asilid.

Windy + chilly. Saw out only occasionally. Mostly aspen, few pines. *Iris missouriensis*, common, heart of green *Erythraea*.

Sta. 204. Mil. 13979. 8050 ft elev. on Hy. 135. 3 mi. S. Almont. *Philotheca* sp. *Aquilegia glandon*; *Coccyzus* (yellow), warblers, bee flies, skippers, *Therionidae*.

Sta. 205. 1 mi. east of Hy. 135 at mouth of Cement Creek. (1 mi. W. Sta. 202). *P. variegata* ♀, *P. scapularis* ♂. Very wet meadow full of dandelions + another yellow flower. 8500 ft. elev.

4 *Colias philodice* ♂ ♀. *Phrynos*, *Erebica*. Bright sun.

2 spp. *Syrphidae*, another fly.

Had dinner in Crested Butte + then took Don back up to Gothic to spend the night in his cabin and get his things in order before we leave tomorrow.

June 19. The early mornings are beautiful; clear + crisp. Even down at Crested Butte snow-capped peaks are all around, and they are real peaks with clear cirques, marked one timberline. At Gothic the narrow valley is surrounded by steep cliffs rising up to 14,000 ft. peaks, largely snow-covered especially after the light snow on Wednesday evening. Wild flowers are profuse in some places, but paintbrush and columbine are not out yet. These valleys are all glaciated, except where there have been landslides, of which there are many. In places it looks as if there had been an unconformity between two types of materials and the upper had slid off. Perhaps the slides are of older glacial materials that were resting on the igneous rocks. Some streams have cut deeply into the glacial valley bottom and then spread out enough to accommodate very elaborate meanderings.

This area began to be developed for skiing in 1960 and now has several fine lodges, 3 lifts, a large jump. It has the facilities of a ski area, but less development - smaller area so far. Only one full season so far, but that one was successful. Another lift is now planned. The area now lacks snow!

Within a mile of this lodge last week a woman caught a 30-inch 9-pound trout (outhern!) and the next day a 10-pound one. This was in a little stream running under a sand sheet.

Sta. 206. Gothic, Colo. (At Rocky Mt Biol Lab.). 9475 ft on small stream.

The laboratory can take care of 80 or 90 students, but it prefers to limit to 50 or 60. Only a few are here this early. There are no regular classes. There are adequate electric facilities, privies, prefitted log huts, various kinds of deer-skin cabins, and one modern cabin.

June 20 Mil. 14041. Left Crested Butte Lodge at 9:30 am.

~~Not~~ gas at Crested Butte. Mil. 14044. about 19 mi. east of Somerset.

Sta. 207. 2.2 mi. west of Crested Butte on Colo. 135 (west of Kebler Pass). Elev. 7700 ft. Mil. 14066. *Lycanids*: *G. lygdamus* ♀♀, *E. comyntas* ♀, *Erebia*, *Coenonympha*. bees + wasps in profusion, sp. *Homodini*, *Asilids*, *honey* *bees*, flying ants, *bioluminescent*, *leucodermis*, *Carabus* 2, *Lepturine*, *elater*, 2 dung beetles with dung pill, fly the many for *Selander*. - living, *bee* flies, 3 damselflies.

This area, just a few miles west of Kebler Pass was completely different from the alpine country. It is chaparral country, with *Ceanothus*, lupine, daisies, sagebrush. No pines or spruce.

Came out at Delta, Colo., where John mailed the Lytta + with flood plants. Post Office closed, but a man took the parcel in after stamps were put on it. Decided to go south through Arroyo to Durango, then west + northwest to by U.S. 160 to Cortez, Colo., Monticello, Utah, + back onto U.S. 50. It was only about 140 mi. to Arroyo, which is little above the Montrose elevation (5820), Arroyo 7721, but surrounded by peaks about 14,000 ft. These are very rugged and connected by high ridges, forming arcs of very rugged country. Not even trails could go across most of these. The Uncompahgre River (n. to Gunnison R.) goes past Arroyo and to Silverton, then the Animas flows south to the San Juan. The pass between, Molas divide, is 10,910 ft.

The Pkts. due w. of Arroyo is Mt. Sneffels (14,150), south of these, the San Miguel, the La Platas; on the other side no single name except San Juan Mts.

June 21. Sta. 208. Arroyo, Colo. El. 7700⁺, hill just east of town.

Sun. *Chalcid* in clover or astragalus - two eggs may be this. *Euclyptus comyntas*, *Plebejus saepiolus*. Wood satyrs (*Coenonympha*). Watched many females but couldn't be sure of hosts. 1 *elater*

Sta. 209. Arroyo, Colo. Amphitheatre Campground, east of town. Elev. 8300 ft. *Everes*, *Aeneis*.

Sta. 210. 2 1/2 mi. S.W. of Arroyo, Colo. on Camp Bird Mine Road. El. 8450. *Papilio damus*, *Polygonia* seen. Took *Coenonympha*, *Aeneis*, *Everes* c., *Celastrina argiolus*.

June 22 Mon. Mil. 14214. Left Ouray about 8 a.m. on the so-called Million Dollar Highway. It is a good highway, but nothing very difficult to build - or drive.

Sta. 211. Mil. 14267. 11 mi. ^{22 mi. n. of Durango} n. of Hermosa, Colo. El. 8100 ft.
P. icaroides 1 ♂, *Eures* 1 ♀, *C. argyrolus* 1 ♂, *E. lygdamus* 1 ♂.

Also *Aglais*. Large lush lupines. 1 rose chafer.

Sta. 212. Mil. 14281. Hermosa, 9 mi. n. Durango, Colo. Roadside flat with some lupines. *P. icaroides* 3 ♂, *P. melissa* 5 ♂, 1 ♀ alive. 1 damselfly. 6500 ft. elev.

Coming into Ouray from the Gunnison valley is abrupt. The very sharp and high ridges are on both the south and east. There is little climb into the narrow valley of Ouray, the Switzerland of America. The two sets of peaks form a half circle around Ouray. There are many high waterfalls or cascades, box canyons too hazardous for the sun to reach bottom. A sharp climb up out to the south, by switchbacks and a series of minor diguays. No meadows or parks between Ouray and Silverton.

At Silverton we passed the road east to Eureka, which is not even shown on most road maps.

At Durango we turn west on US 160 to ^{Colo.} Cortez and Monticello, Utah. Should be semi-desert plateau country.

Durango mileage 14291.

Sta. 213. 20 mi. w. Durango, Colo. on US 160. Elev. 7350 ft.

P. aspiolus 2 ♀, *P. melissa* 1 ♀, *Lycana miralis* ♀, bombylids, nymphalids, *Canonympha*, *Phycodes*, *Lione*. Open area in scrub oak gone. Windy.

Sta. 214. Mesa Verde Nat. Park, Colo. 5 mi. from entrance. (open meadows beyond tunnel). East of Overlook (Montezuma Valley). 7300 ft. (7400 ft. on lupines pressed) Many eggs, all but one on buds, prob. *lygdamus*. *E. lygdamus* ♂ ♂, *E. glandon*, 1 *E. comyntas*, 2 *P. asmon* 1 ♂ 1 ♀ alive. Rather fly with its tabanid prey. *Phycodes*, *Melitaea*, *Canonympha*, many *Acanacodera*, 1 sm. Chrysidid.

We went into the park only about six miles, but had fine views of surrounding high mountains - north and east.

June 23 Tues. Mil. 14417. After breakfast took unnumbered road up into the Abajo Mts. west of Monticello, Utah.

Sta. 215. Dalton Springs C.G., Abajo Mts., San Juan Co., Utah. Elev. 8000. (Mil. 14423). Many *P. aspiolus*, some ovipositing on small white clover. *E. comyntas*. Pressed clover + a lupine (non-host but with a chrysomelid larva - black - same as at Gothic). Velvet ant and bald-faced hornet. Lowrey camped here with Keith Nelson in 1947.

Sta. 216. El. 8750 ft. Abajo Mt. - Blanding road, 1 mi. west of Dalton Springs C.G., (1 1/2 mi. w. of Monticello). ~~Colo.~~ ^{Utah} Syrphidae, many, Aulids, vespid. Monticello mileage 14441.

Avalon Cafe. Asked about wide-mouthed jars, and "Gus" said we could have all we could carry - up to 30 or so!
Sta. 217, 2 mi. n.e. Ta Sal, Utah. El. 6900 ft. 1 nymphalid.

Sta. 218. East foot of Ta Sal Pass, elev. 7550 ft. Ta Sal Mts., San Juan Co., Utah. *P. icarivides* ♀. *Eures comyntas* 1 ♀, ♂♂
Phycodes, *Coenonympha*, Chrysidid. 2 mi. w. Hy. 24.46.

Sta. 219. East foot of Ta Sal Pass, elev. 7800 ft. Ta Sal Mts., Utah. Rocky meadows along stream. Edge of aspen + pine belt, but mostly scrub oak. *E. comyntas* 1 ♀, many ♂♂, *P. aspioides* ♂♂, 1 ♀, *P. icarivides* 1 ♀, *A. glandon* ♂♂, ♀, *G. lygdamus* 1 ♂, *P. melissa* 1 ♂. *Euclyptus*, *Phycodes*, *Coenonympha*. Flies, hymenoptera. 3 1/2 mi. w. Hy. 24.46

June 24 Mileage 14664. at Price, Utah.

Wed. Sta. 220. 2 mi. w. Soldier Summit, Utah. El. 6300 ft. *P. melissa*, *Melitaea* (nymph).

Down into Utah Valley + up Provo Canyon.

Sta. 221. Aspen Grove (C.G.), east side of Timpanogas Mts., Utah. El. 5800 ft. *E. comyntas*, *P. icarivides*, *C. argialis*, *Lycaena nivalis*, *Osmacodera*, small *hupicid*, *Compyrid*, *Phycodes*, *Coenonympha*, 1 megalopteran, flies.

Sta. 222. Mouth of Big Cottonwood Canyon, Salt Lake Co., Utah. El. 5100 ft. Lupine in seed, past prime. Many *P. icarivides* ♀♀, *P. melissa* ♂♂. *Hemognathus*, *Lepidoptera*. *Corydalus*. on thistle

June 25. John mailed home three batches of eggs to Mary, from captured females of *P. icarivides* (Sta. 218) Ta Sal Mts., *P. aspioides* (Sta. 215) Dalton Spr., Abasco Mts., & *Lygdamus* (Sta. 208) Ouray, Colo. & *G. lygdamus* a few field taken eggs Sta. 214 in Mesa Verde Nat. Park, Colo. Salt Lake City, mil. 14874.

Sta. 223. Peguop Summit, Nev. Elev. 6750 ft. *P. icarivides* ♂ and 10 eggs. Flower beetles. Preset on. of lupine from each side of road (south seems to be glabrous + north hairy) also other flowering plants for Mohlenbrock.

June 26 Mil. 15127 at Elko, Nev.

Fri. Yesterday was the Rawney's wedding anniversary and we stopped in Wells at the hotel at which they stopped on their honeymoon. It was just opened then, but has changed hands since. 15 years ago.

All the desert mountains seemed more rugged than I recalled. The Ruby Mts. had a great deal of snow on both sides.

The Bonneville salt flats had large areas under water, including the speed trail run. The Humboldt River had a lot of water. This was apparently the first warm day of the summer. 90°

Left at 8:40 on Nov. 21, Mil. 15171. 10:20 a.m. Sta. 224. 47 mi. s. U.S. 40 on Nov. 21. Foot of Mt. Tenabo. El. 5000 ft. Flowers of *Cleome*, few hymenoptera + bugs + 1 dermestid. B. sepius on prickly pear flower. Edge of valley.

Sta. 225. Austin, ~~Calif~~ Nev. Elev. 6800 ft. Gulch above town
+ below pass. *P. icarioides* ♂♂, *P. melissa* ♀♀, *E. comyntas* ♀♀.
E. c. on *Astragalus* (pressed sample). Pressed samples of *Lupine*
also a ribworty pubescent hybrid, + other flowers. *Echeodes*,
dragonfly, yellow bumble bee, 2 robber fly in copula.

Sta. 226. Campbell's Canyon, mi. below Carroll Summit,
Elev. 6250 ft. 1 mi. above mouth of canyon. 6 eggs. 1 blue flying.
Lupine pressed + 3 other plants.

June 27 Mileage 15419 at Fallon, Nev. Nevada

Sta. 227. US 40 west of Reno, in mouth of Truckee River
Canyon, elev. 5000 ft. *Satyrium behrii* (Calliopsis)
many in jar alive, *P. icarioides* 1, *P. arman*, *P. rufipolus*,
E. comyntas. Skippers, *Targuius admiral*, *Comonympha*,
Phycodes, *Melipotis*, *Chloris*, *Mordellids*, green
Epicauda, small chafers, min. flies + hymenoptera.

Sta. 228. 2 mi. northwest of Alpine, Calif. Cal. sta 89.
Elev. 5400 ft. *Mitoura*, *C. argiola* both on *Canotinus*.
2 chafers, green meloid, skippers + geometer.

Sta. 229. Quincy, Calif. Elev. 3450 ft. Plumas County.
A few beetles flying at dusk. (In alcohol)

June 28. Mileage 15597. at Quincy, Calif.

Sun. Sta. 230. Butterfly Valley, Calif. 2 mi. S.W. Hy 89
Rd. Quincy + ~~Quincy~~ ^{Skeddie}. Elev. 3700 ft. *P. rufipolus*
many ind. live females; *C. argiola* ♂♀, mimic moth
phalaenid. Ailid like bumble bee, cicadas, *Echeodes*,
Lepturini, ichneumonid. Admiral.

Sta. 231. Crescent Mill, Calif. on hy 89. Elev. 3500 ft.
Plumas Co. *P. icarioides*, *Speyeria*, *Lyc. xanthoides*.

Striped lepturines, large glaucous humblid, large red scolid
Eggs on minute lupine + also on glaucous larger one. Mil. 15617.

Sta. 232. Lake Almanor, Calif. Elev. 4500 ft. Many
lepturines, 1 green cerambycid, bees. 'Colias'.

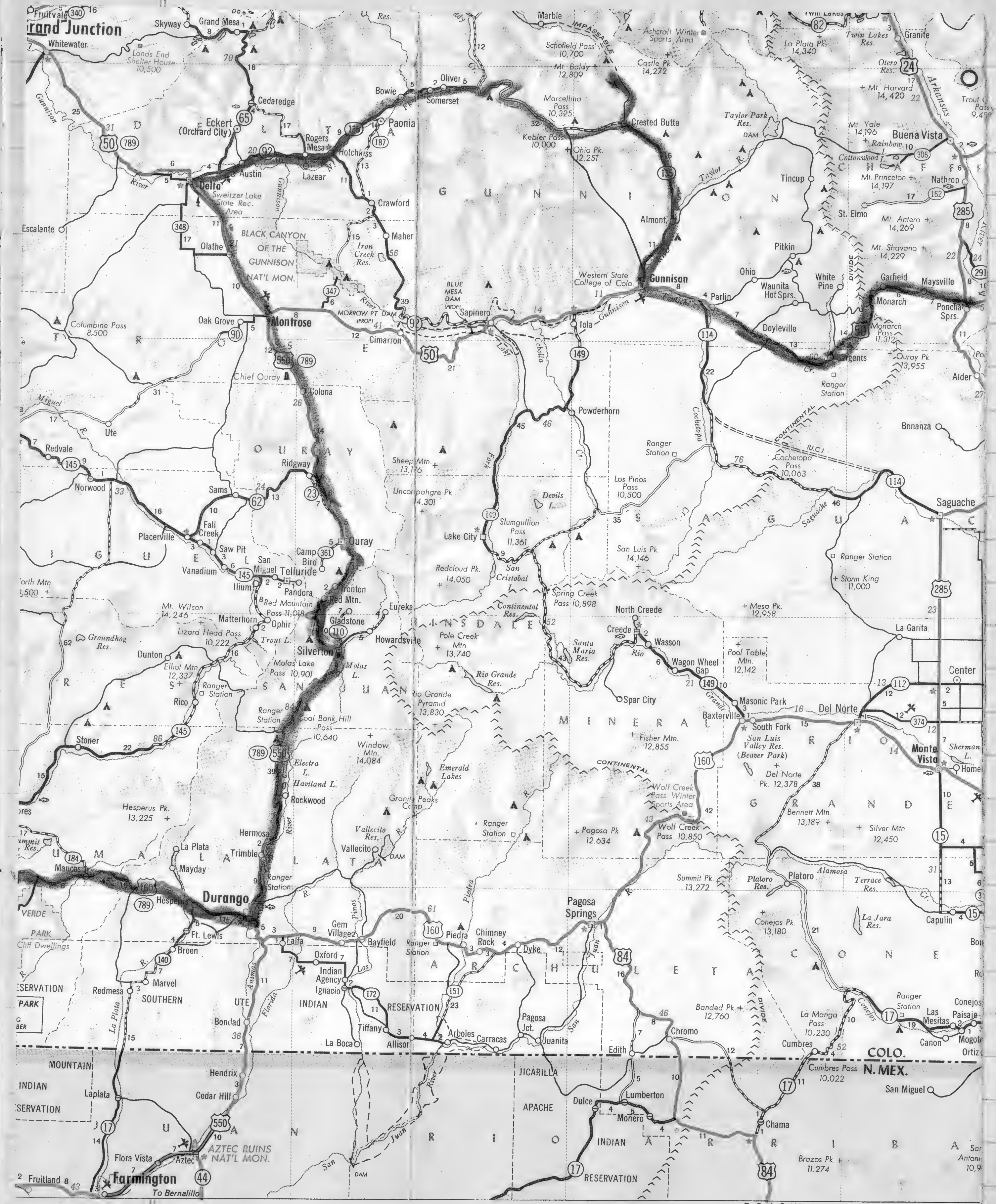
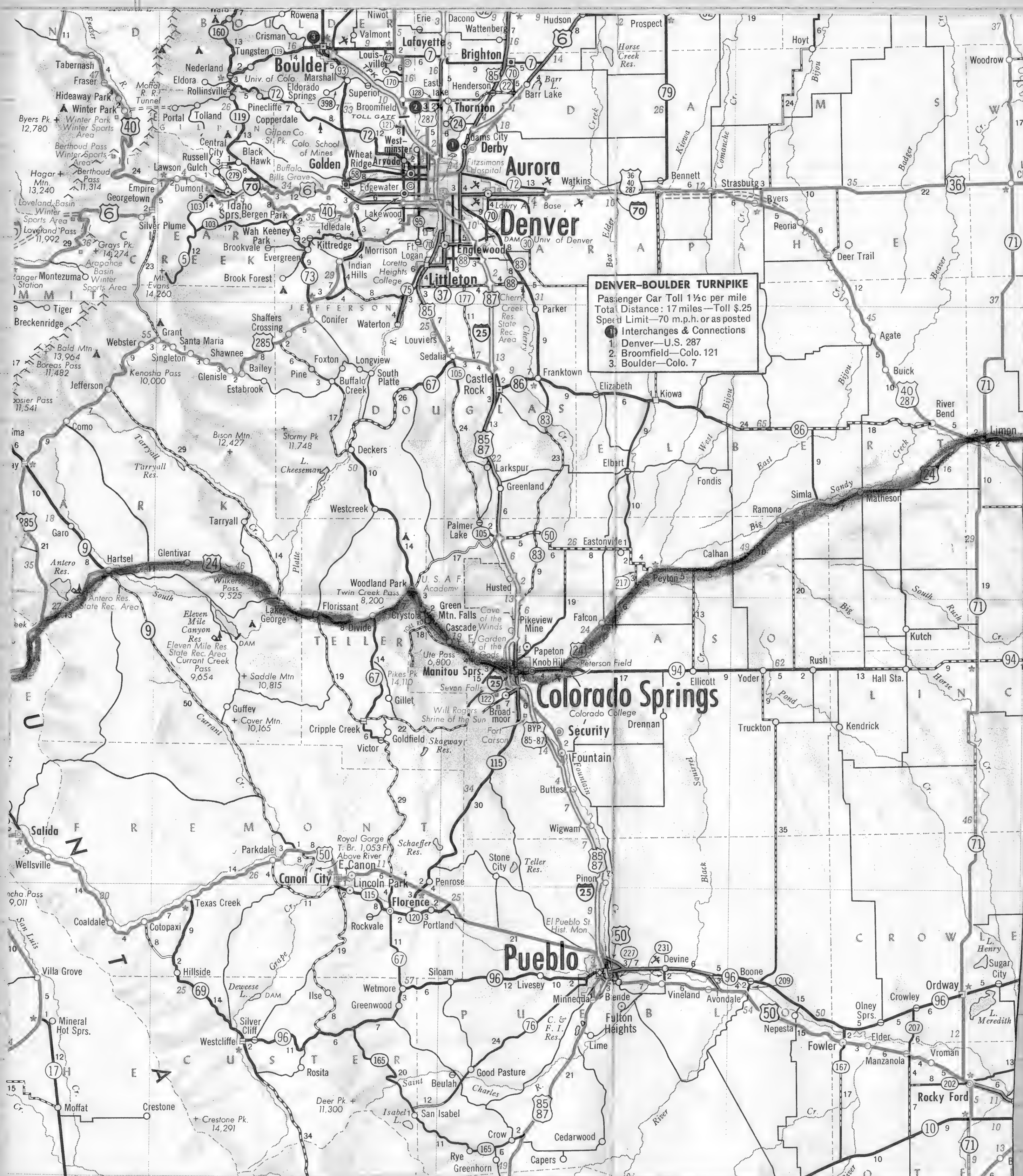
June 29 Mileage 15707. Mammoth Lake Lodge, Lassen Park.

Mon. This will probably be my last day in the party.
John was quite suddenly sick to stomach last night,
and still feels queasy. Viola

Sta. 233. 7 mi. S. of Mammoth Lake, at Vida, Calif.
Elev. 7300 ft. Calif. sta. 44. *Callophrys* ³² alive.

Incaulia angustipes, *P. icarioides*, *P. rufipolus*.
12 females many males, *C. argiola*, *Attila halensis*,
Phycodes, *Brenthia*, "baly morpho"

Pieris rapae, bee-mimicking Ailid, scarabid nymphs,
Histeridae, Staphylinid, Aphodius, other arithids +
theriid, red cerambycid, small hysanths,
trichoptera.



If You Need Information, Ask a Park Ranger!

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HELP US PROTECT AND MAINTAIN THE PARK BY OBSERVING ALL REGULATIONS

- Cliff dwellings are entered **ONLY** with Rangers
- Ruins and all archeological objects must be left undisturbed.
- Natural features and public property must not be defaced.
- National Parks are wildlife sanctuaries. Hunting not permitted.
- Firearms are not permitted.
- Do not feed, tease or molest birds or other animals.
- Do not pick wildflowers or damage trees or other vegetation.
- Fires may be built **ONLY** in designated campgrounds.
- Dogs, cats and other pets must be kept on leashes or in cars at all times.
- PETS ARE NOT ALLOWED ON TRAILS OR IN PUBLIC BUILDINGS.**
- Do not roll or throw rocks or other objects into the canyons. Someone may be below.
- Do not throw trash anywhere in Park. **USE YOUR TRASH BAG OR TRASH RECEPTACLES.**

Trails—Use designated sites in public campgrounds.

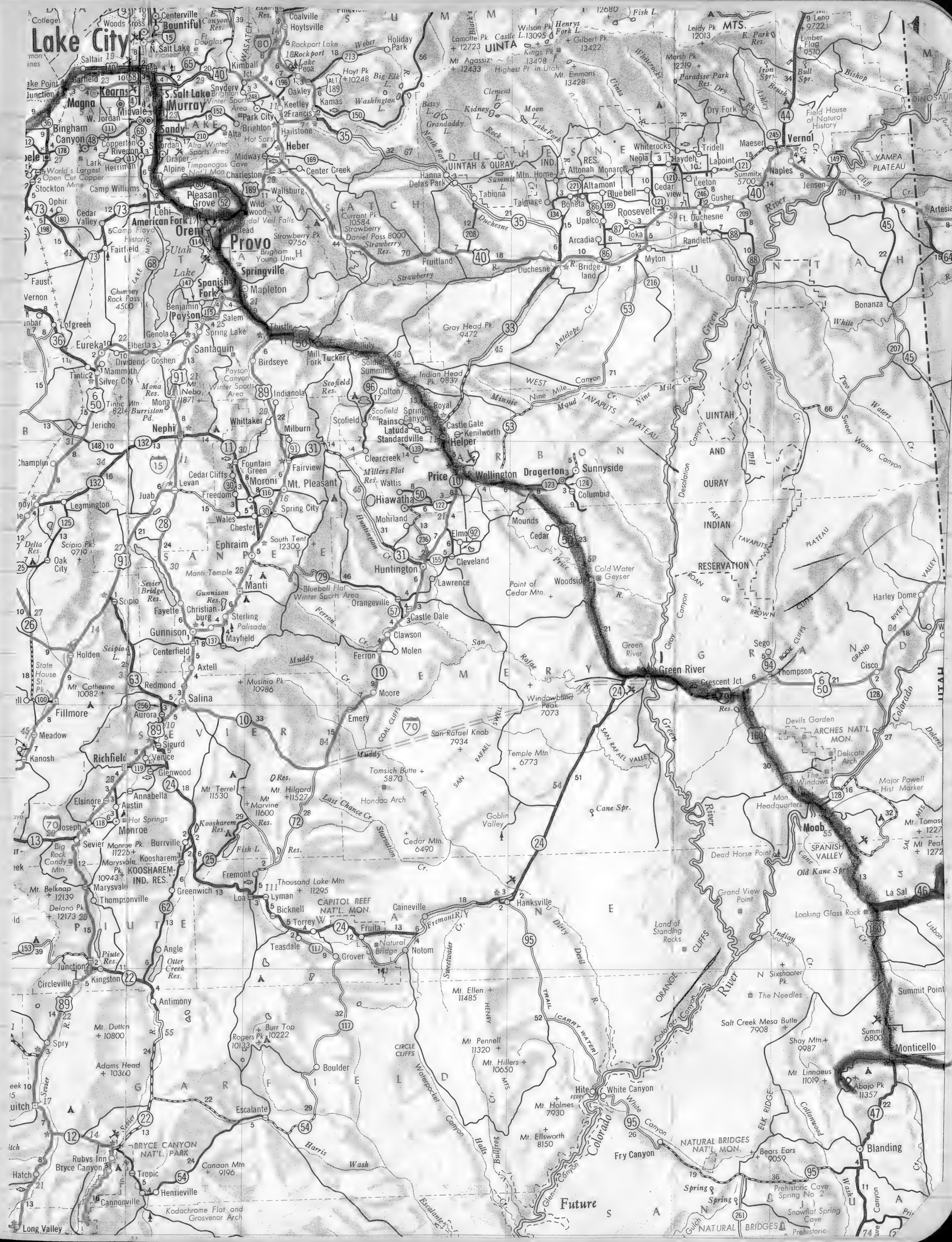
Picnicking—Authorized in picnic areas on ruins road or public campgrounds only.

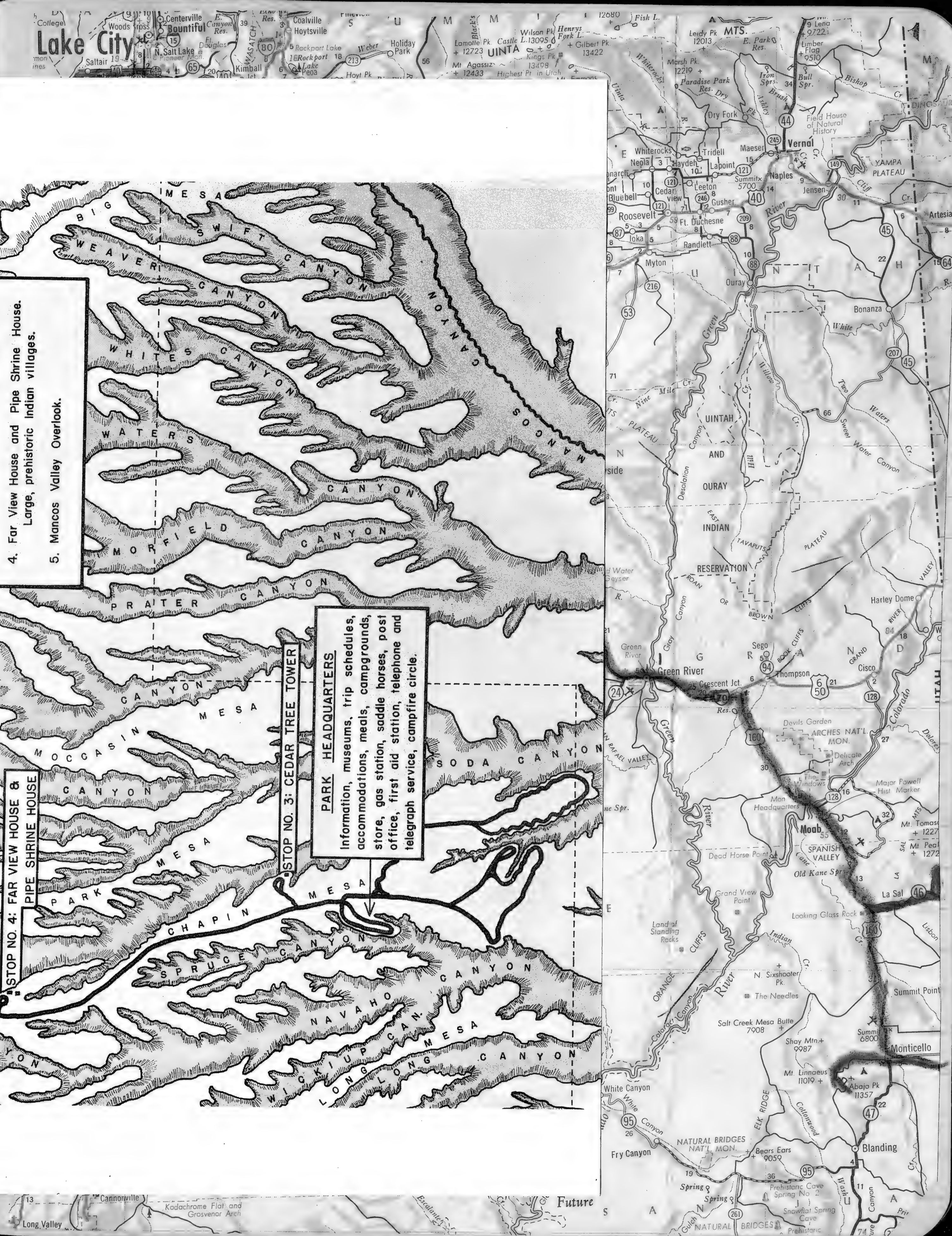
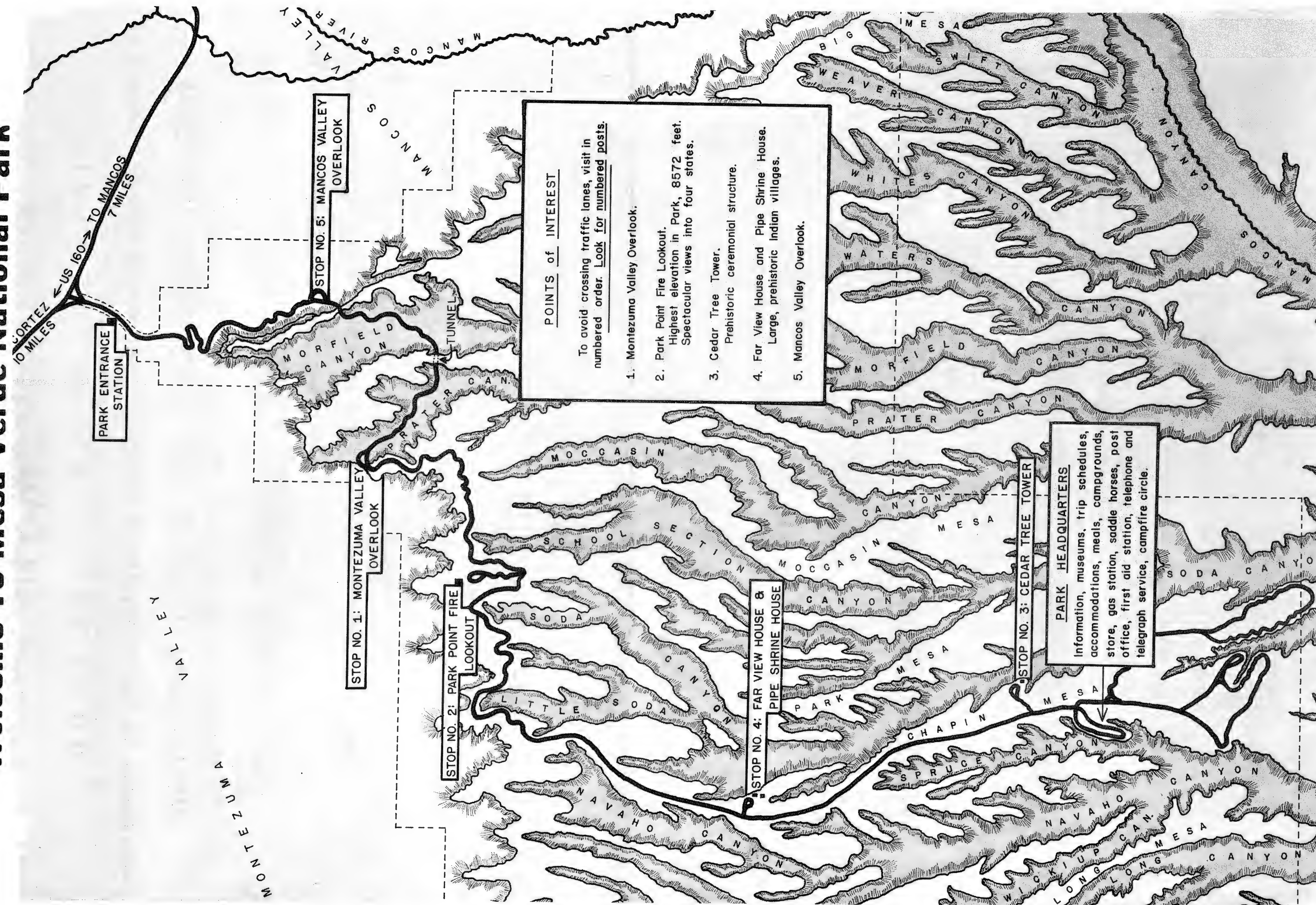
FIRST AID STATION—At Park Headquarters.

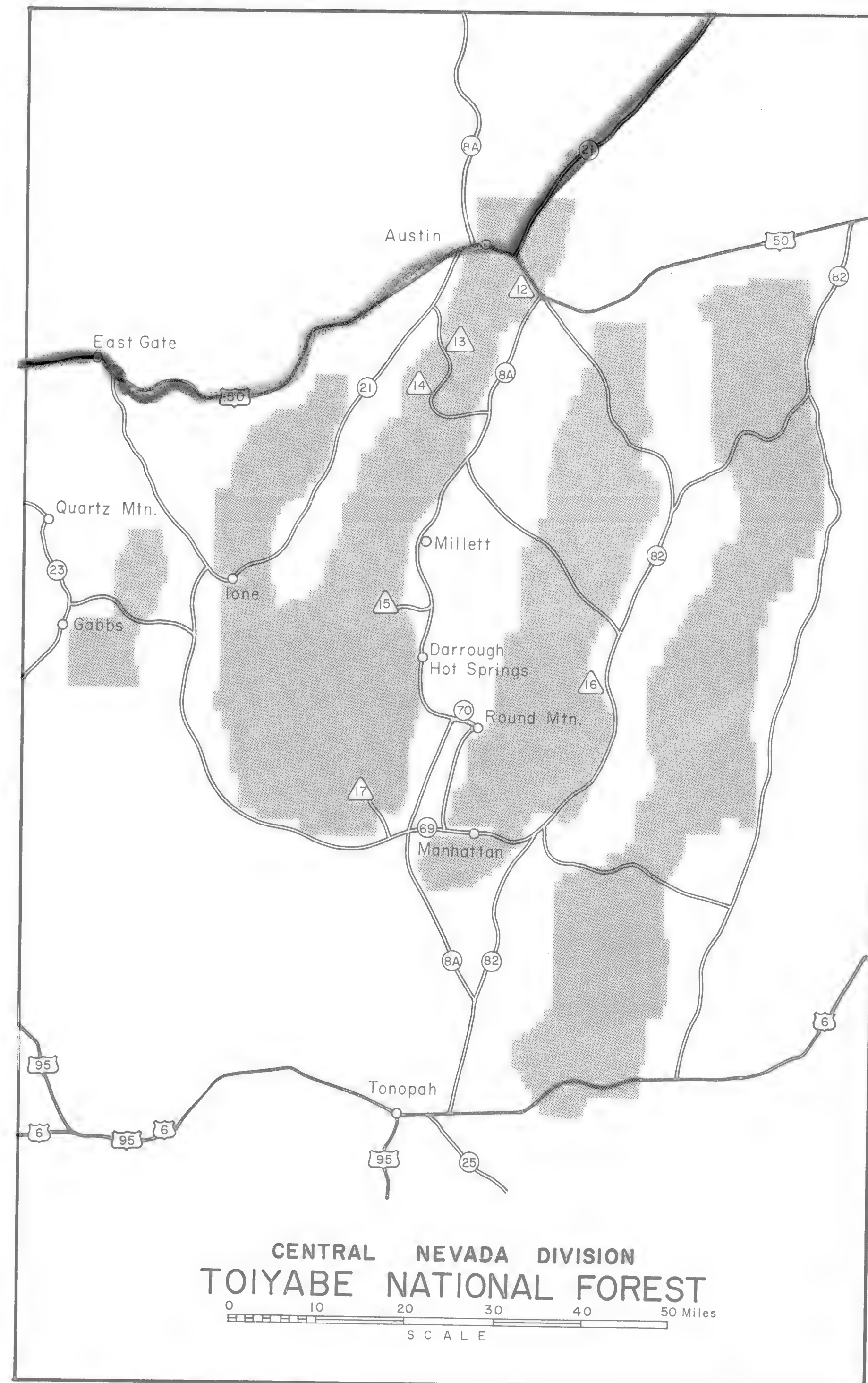
POST OFFICE—At Park Headquarters.

THINGS TO DO IN THE PARK—Inquire at Information Desk in MUSEUM concerning:

- Free Ranger-guided trips to cliff dwellings
- Self-guiding automobile trips to mesa-top ruins
- Ruins road drives
- Hiking (Limited written permits required)
- Evening campfire programs
- Church services



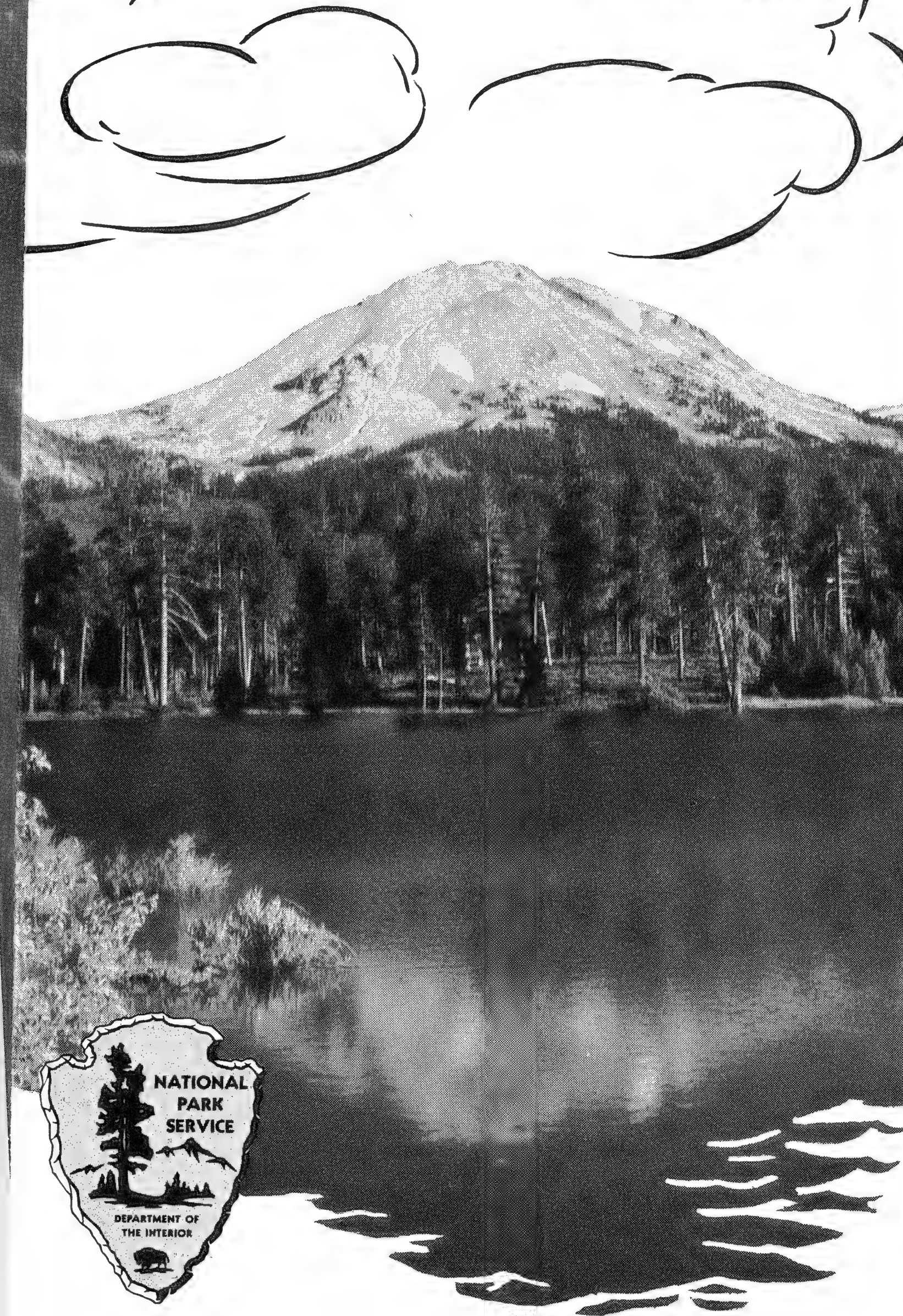




LASSEN VOLCANIC

NATIONAL PARK

California



WARNING

In hot springs or steaming areas **STAY ON ESTABLISHED TRAILS AT ALL TIMES**; keep small children under strict physical control to avoid burns and accidents. Safe-appearing ground crusts may be dangerously thin.

LASSEN VOLCANIC

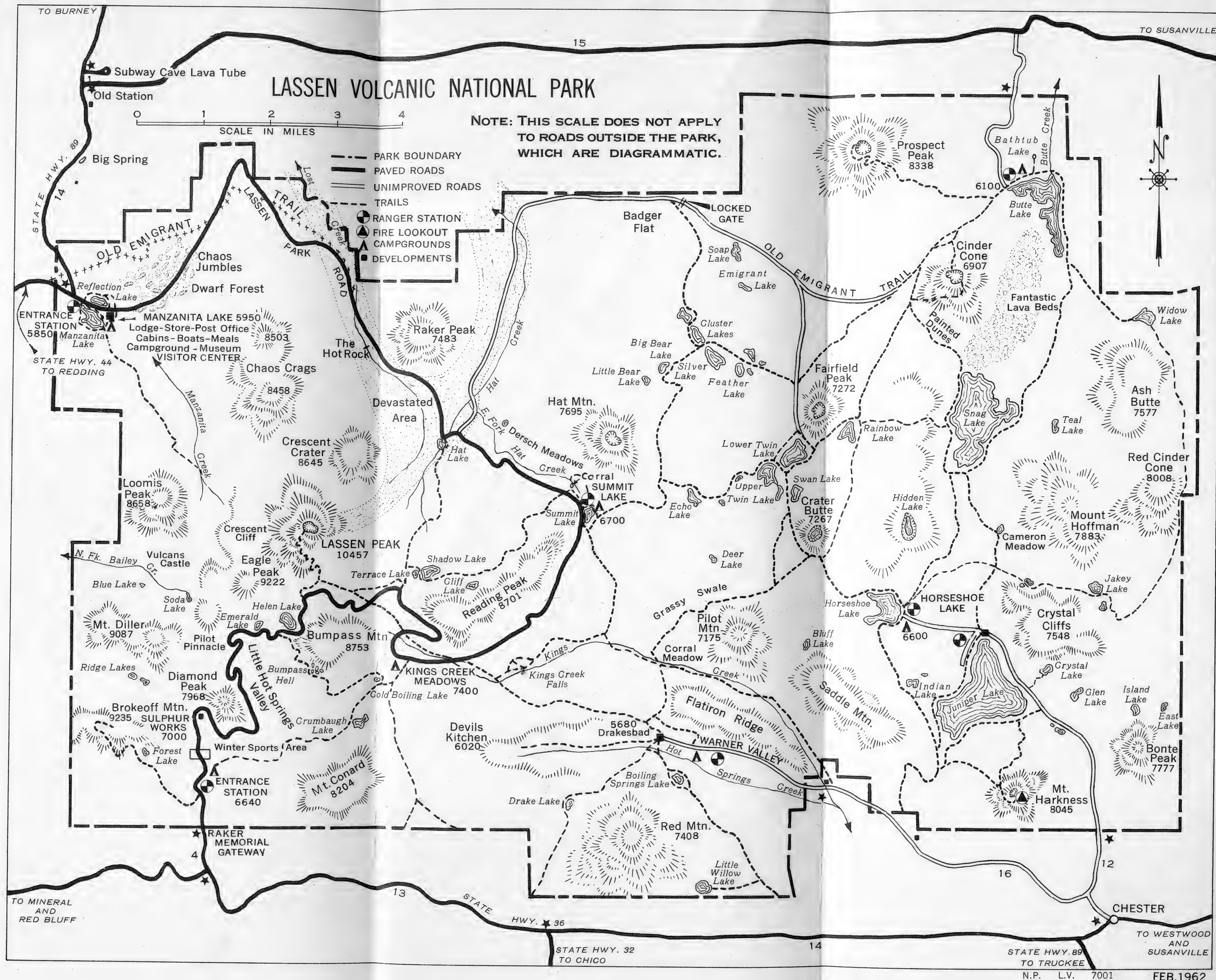
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given at Manzanita Lake and Summit Lake.

The Manzanita Lake Visitor Center was given to the park by Mr. and Mrs. B. F. Loomis. The building houses a series of dioramas and exhibits that explain the geological story of the park and vicinity. Illuminated transparencies tell of the eruptions of Lassen Peak. Ethnological and historical exhibits portray human aspects of the Lassen story. Publications dealing with park subjects, and topographic maps are on sale at the visitor center; and an attendant is on duty to provide general information.

You are invited to take advantage of the naturalist services, for which there is no charge. Announcements of the programs and schedules are posted on the bulletin boards.

Fishing

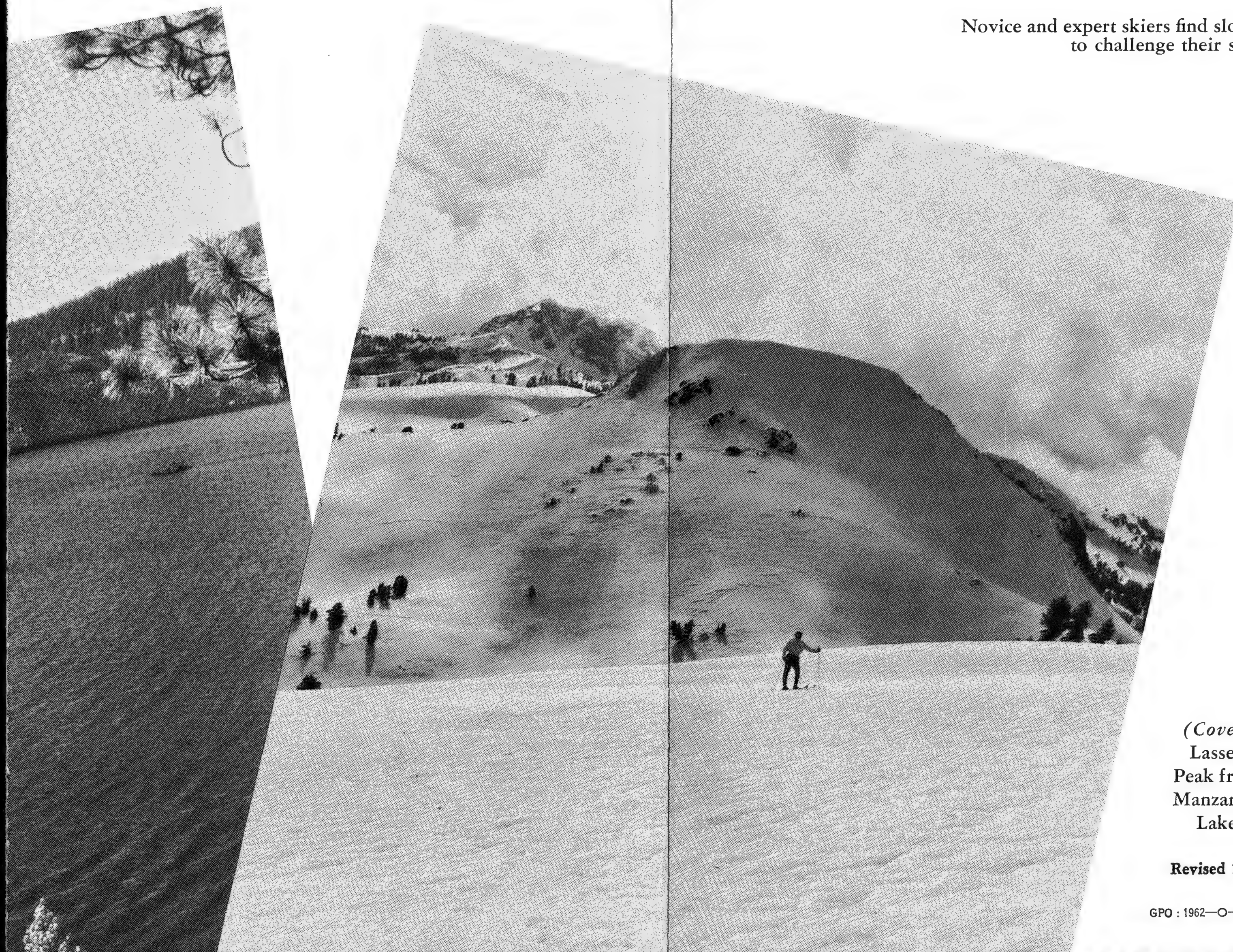
Angling is one of the recreational activities which may be

enjoyed in this park. Rainbow trout, which are native to the waters, are abundant. Brook and brown trout, which are introduced species, are plentiful in some places. The brown bullhead also was brought in; it is found in Manzanita and Reflection Lakes.

Hiking and Horseback Trips

The eastern wilderness and lake sections of the park can be enjoyed only by hikers and horseback parties. Over 100 miles of trail lead to remote sections of the park. Colorful hot springs, gorgeous wildflower meadows, silvery lakes, and other wonders await those who leave the roads and take to the trails. Saddle and pack trips will be arranged for those desiring this service. Hikers can travel the well-marked trails without guides, including the Lassen Peak Trail, where horses are not allowed.

Novice and expert skiers find slopes
to challenge their skill

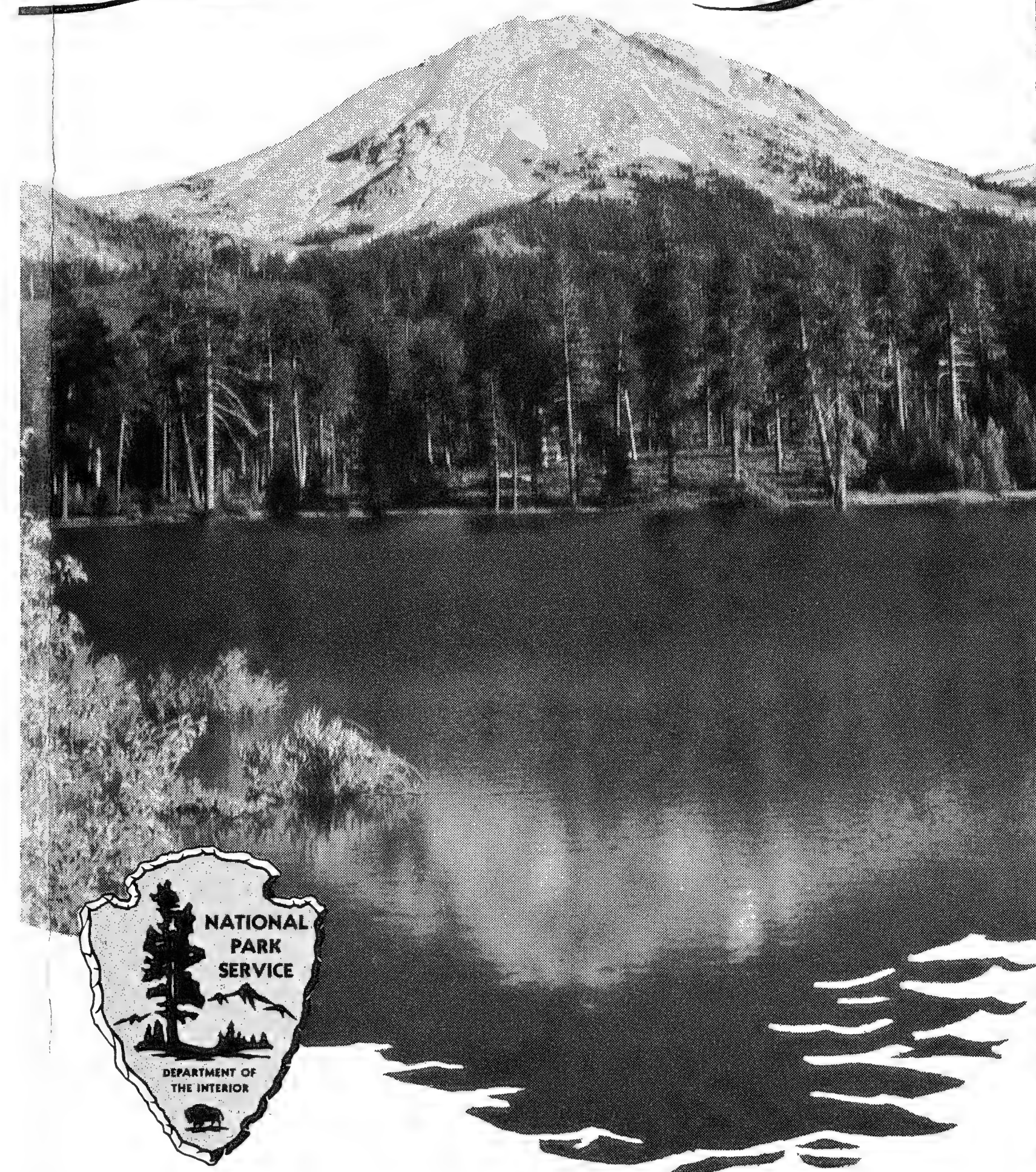


(Cover)
Lassen
Peak from
Manzanita
Lake

Revised 1962

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LASSEN VOLCANIC NATIONAL PARK California



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